IJAYUSH
International Journal of AYUSH
AYURVEDA, YOGA, UNANI, SIDDHA AND HOMEOPATHY
http://internationaljournal.org.in/journal/index.php/ijayush/
International Journal
Panacea
Research library
ISSN: 2349 7025

Review Article **Volume 14 Issue 06** **June 2025**

UNDERSTANDING *NIDRA AND SWAPNA* THROUGH AYURVEDIC AND NEUROPHYSIOLOGICAL PERSPECTIVES: A COMPREHENSIVE REVIEW

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ABSTRACT

Background: *Nidra* (sleep) and *Swapna* (dream) are integral physiological and psychological processes discussed extensively in Ayurvedic classics. Ancient seers recognized *Nidra* as one of the *Trayopastambha* (three pillars of life) essential for maintaining health. In the modern era, sleep and dreams are viewed through neurophysiological, behavioral, and cognitive lenses. A comprehensive understanding of these concepts through Ayurvedic and modern perspectives is vital to exploring their role in health maintenance and disease prevention. **Aim And Objectives Aim:** To comprehensively analyze and correlate the concepts of *Nidra* and *Swapna* from *Ayurvedic* literature with modern neurophysiological understanding. **Objectives:** To explore the classical *Ayurvedic* concepts of *Nidra* and *Swapna* with relevant references. To review the neurophysiological mechanisms of sleep and dream in modern science**.,** To identify points of correlation and divergence between bo*th systems. To evaluate the clinical relevance of *Ayurvedic* principles in sleep health and dream interpretation. To suggest an integrative approach for better understanding and management of sleep-related disorders. **Methods:** An extensive literary review was conducted using classical Ayurvedic

texts including *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, and other traditional commentaries. Modern medical literature, including neurophysiology textbooks, research journals, and clinical studies related to sleep science and dream analysis, was also reviewed. A comparative analytical approach was used to synthesize information. **Results:** Ayurveda describes *Nidra* as a natural state caused by the withdrawal of the mind and senses, with types such as *Manasharira Shrama Sambhava* and *Tamasika Nidra*. *Swapna* is viewed as a manifestation of residual impressions (*Samskaras*) and *Manasika Bhavas*. Modern science classifies sleep into REM and non-REM stages and explores dreams as a product of limbic and cortical activity. Several correlations were identified, such as the role of *Tamas* and melatonin, the function of *Vata Dosha* in dream content, and psychosomatic links to sleep disorders. **Conclusion:** The integration of Ayurvedic and neurophysiological views provides a deeper insight into the multidimensional nature of sleep and dreaming. This review supports the relevance of Ayurvedic wisdom in understanding modern sleep physiology and may contribute to holistic approaches in managing sleep disturbances and psychosomatic disorders.

KEYWORDS: *Nidra, Swapna, Ayurveda, Sleep physiology, Dreams, Neurophysiology, Trayopastambha, REM sleep, Tamas, Manas*

INTRODUCTION

Nidra (sleep) is considered one of the essential pillars of life (*Trayopastambha*) in *Ayurveda*, along with *Ahara* (diet) and *Brahmacharya* (regulated conduct). It plays a pivotal role in sustaining physical, mental, and emotional health. Classical texts such as *Charaka Samhita* describe *Nidra* as the natural state that occurs when the mind detaches from sensory objects, leading to rest and restoration of body and consciousness. *Swapna* (dreams), on the other hand, are seen as reflections of *Manasika Bhavas* (mental states), residual experiences, or subtle activities during the sleep state.[1]

In *Ayurvedic* philosophy, *Nidra* is not merely an absence of wakefulness, but a constructive physiological event necessary for maintaining *Dhatu Samya* (tissue equilibrium), mental clarity, and *Ojas* (vital essence).[2] Sleep deprivation or disturbances are believed to lead to various conditions including *Manovikara*, *Agni Dushti*, and even premature aging. Similarly, *Swapna* analysis is traditionally linked with diagnosis and prognosis, especially in the context

of *Swapna Vijnana* as described in *Indriya Sthana*. Thus, both concepts hold not just theoretical, but clinical significance.[3]

Modern science explores sleep through neurophysiology, identifying it as a state of altered consciousness regulated by circadian rhythms, neurotransmitters like melatonin, and complex brain networks. Sleep is divided into REM (Rapid Eye Movement) and non REM stages, each associated with different types of brain activity. Dreams, particularly during REM sleep, are studied in cognitive science and psychology as expressions of subconscious processing, emotional regulation, and memory consolidation.[4]

Despite advancements in modern neuroscience, many aspects of sleep and dreams remain elusive, particularly regarding their subtle influences on mental health and personality. Ayurveda, with its holistic and time-tested approach, provides insight into the qualitative aspects of sleep and dreams—linking them to *Dosha*, *Manas*, *Sattva-Rajas-Tamas*, and seasonal variations. Integrating both perspectives can offer a broader, more nuanced understanding of sleep as a multidimensional phenomenon.[5]

This review aims to bridge traditional *Ayurvedic* wisdom with modern neurophysiological understanding of *Nidra* and *Swapna*. By conducting a comparative analysis, the article endeavors to highlight areas of correlation, contrast, and complementarity. It also discusses the potential of integrating these views for better clinical assessment, disease prevention, and therapeutic strategies related to sleep disorders and psychological disturbances.[6]

AIM AND OBJECTIVES

Aim:

To comprehensively analyze and correlate the concepts of *Nidra* and *Swapna* from *Ayurvedic* literature with modern neurophysiological understanding.

Objectives:

1. To explore the classical *Ayurvedic* concepts of *Nidra* and *Swapna* with relevant references.
2. To review the neurophysiological mechanisms of sleep and dream in modern science.
3. To identify points of correlation and divergence between both systems.
4. To evaluate the clinical relevance of *Ayurvedic* principles in sleep health and dream interpretation.
5. To suggest an integrative approach for better understanding and management of sleep-related disorders.

MATERIAL AND METHOD:

This review is based on a comprehensive literary study. Classical *Ayurvedic* texts such as *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, and their commentaries were thoroughly analyzed for references on *Nidra* and *Swapna*. Modern scientific data were collected from standard textbooks of physiology, neurology, and psychology, along with indexed journals and online medical databases. A comparative and analytical approach was adopted to synthesize and correlate both perspectives.

CONCEPTUAL STUDY ON NIDRA

The term *Nidra* is derived from the Sanskrit root "***ni + dra***", meaning "to sleep" or "to lie down." It is described as a natural, involuntary state characterized by temporary suspension of sensory and motor activities, allowing the body and mind to recuperate. In *Charaka Samhita* (Sutra Sthana 21.36), *Nidra* is defined as the state resulting from the withdrawal of *Indriyas* (senses) and *Manas* (mind) from their respective objects, leading to rest and restoration. It is not seen as passive rest alone but as an active process that rejuvenates all *Dhatus* (tissues), strengthens *Agni* (digestive fire), enhances *Ojas* (vital essence), and supports *Sharira* (body), *Manas* (mind), and *Atma* (consciousness).[7]

Nidra as One of the Three Supporting Pillars

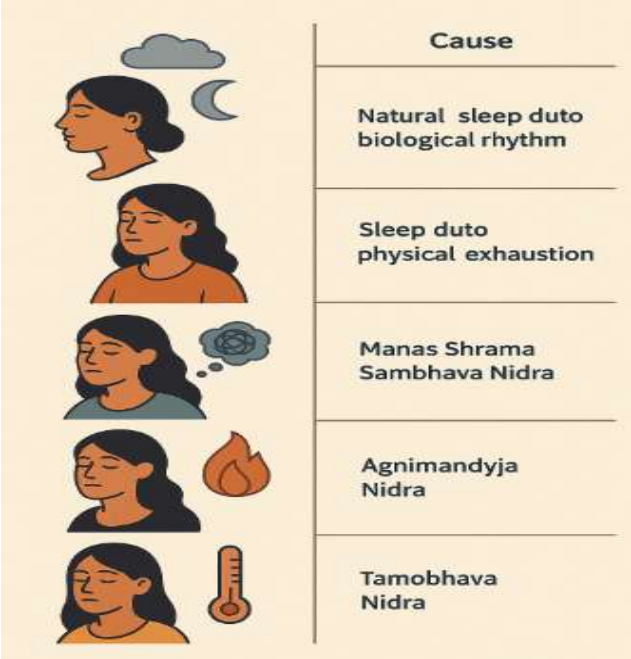
Nidra is classified as one of the *Trayopastambha* (three supportive pillars of life), along with *Ahara* (diet) and *Brahmacharya* (regulated conduct). This triad forms the foundation of health and longevity. Proper sleep ensures optimal physical strength, mental clarity, complexion, digestion, and reproductive health. According to *Charaka Samhita*, happiness, nourishment, strength, knowledge, and longevity are all dependent on adequate sleep, whereas insufficient or disturbed sleep can lead to emaciation, fatigue, mental confusion, and even premature death.[8]

Types of Nidra

Nidra is classified into six types in *Charaka Samhita* (Sutra Sthana 21.58), based on their causative factors:

TABLE NO. 1 - TYPE OF NIDRA

Type of Nidra	Cause
Swabhavika Nidra	Natural sleep due to biological rhythm
Sharira Shrama Sambhava Nidra	Sleep due to physical exhaustion
Manas Shrama Sambhava Nidra	Sleep due to mental fatigue
Agnimandyaja Nidra	Sleep due to diminished digestive activity
Vikaraprabhava Nidra	Sleep caused by disease or pathological condition
Tamobhava Nidra	Sleep induced by excess of *Tamas* and *Kapha* doshas



This classification reflects the intricate understanding of physiological and pathological triggers behind sleep.

Role of Nidra in Health and Disease

Nidra plays a key role in maintaining equilibrium of *Doshas*, strengthening immunity, improving mental faculties, and stabilizing *Prana* (vital life force). Insufficient or excessive sleep is considered a causative factor in several diseases such as *Unmada* (psychosis), *Atisara* (diarrhea), *Pandu* (anemia), *Madhumeha* (diabetes), and *Kasa Shwasa* (respiratory disorders). Sleep disturbances are also associated with vitiation of *Vata* dosha. Hence, the Ayurvedic approach to sleep emphasizes balance, individual constitution (*Prakriti*), seasonal variation (*Ritu*), and mental status (*Manas Bhava*).[9]

CONCEPTUAL STUDY ON *SWAPNA*

Swapna refers to dreams, which are visual or sensory experiences occurring during the state of *Nidra*. Ayurveda explains that when *Indriyas* become inactive and the *Manas* is partially active, it reflects impressions stored in the subconscious mind. These impressions (*Samskaras*) are shaped by past actions, desires, and emotional states. Dreams may also arise from *Dosha* imbalances, mental stress, or suppressed thoughts.[10]

Classification of Swapna

Charaka Samhita (Sharira Sthana 4.58) classifies dreams based on their origin:

TABLE NO. 2 CLASSIFICATION OF SWAPNA

Type of Swapna	Description
Drishta	Dreams of things previously seen
Shruta	Dreams of things previously heard
Anubhuta	Dreams of things previously experienced
Prarthita	Dreams of things intensely desired
Kalpita	Imaginary or fabricated dreams
Bhavika	Dreams formed by present mental and emotional tendencies
Dosha Prakopaja	Dreams caused by vitiated *Doshas*, often pathological

This classification shows Ayurveda's attempt to interpret the psychology and pathology behind dreams.

Prognostic and Diagnostic Importance

In texts like *Indriya Sthana* of *Charaka Samhita* and *Sushruta Samhita*, dreams are used for prognosis. Some dreams are considered *Shubha* (auspicious) and others *Ashubha* (inauspicious), helping in prediction of future health events or mortality. Vitiation of *Vata* may cause flying or falling dreams, *Pitta* causes fire or war-like dreams, and *Kapha* causes water orstillness dreams. Thus, *Swapna* is used as a tool for assessing both psychological and doshic imbalance.[11]

Concept of Sleep and Dreams in Modern Physiology

Sleep Architecture and Mechanism

Modern science explains sleep as a dynamic and cyclic process regulated by the hypothalamus, pineal gland, and brainstem centers. The suprachiasmatic nucleus of the hypothalamus maintains circadian rhythm through melatonin secretion. Sleep is divided into:

- **Non Rapid Eye Movement sleep (NREM)**: Includes stages 1 to 4, from light sleep to deep restorative sleep.
- **Rapid Eye Movement sleep (REM)**: Associated with vivid dreaming, memory consolidation, and emotional processing.

Each night, the body undergoes several sleep cycles alternating between NREM and REM stages. Neurotransmitters like serotonin, GABA, and acetylcholine regulate this rhythm.[12]

Importance of Sleep

Sleep supports physical recovery, boosts immunity, regulates hormonal function, enhances learning and memory, and stabilizes mood. Sleep deprivation is linked to cardiovascular disorders, diabetes, psychiatric illnesses, and cognitive decline. Clinical sleep disorders include insomnia, narcolepsy, obstructive sleep apnea, and REM behavior disorder.[13]

Scientific Understanding of Dreams

Dreams are explained through various theories such as:

- **Activation synthesis theory**: Random neural activity is interpreted by the brain as dream narratives.

- **Memory consolidation theory**: Dreams reflect the brain processing recent information and emotions.
- **Cognitive theory**: Dreams mirror waking thoughts, fears, and unresolved conflicts.

Neuroimaging shows that the amygdala, hippocampus, and visual cortex are active during REM sleep, while the prefrontal cortex remains subdued, explaining the emotional and illogical nature of dreams.[14]

Table. 3 Integrative Correlation between Ayurveda and Modern Science

Ayurvedic Concept	**Modern Equivalent**
Dominance of Tamas and Kapha	Melatonin secretion, sleep drive, brain inhibition
Nidra as Trayopastambha	Recognition of sleep as essential for health and healing
Dosha based Swapna analysis	Neurochemical basis for dream types and emotional states
Manashrama Nidra	Mental fatigue induced sleep
Dosha Prakopaja Swapna	Dreams in psychiatric disorders or sleep disturbances
Nidra Vega and Vega Dharana	Sleep urge suppression and consequences

This comparative table demonstrates that ancient Ayurvedic wisdom and modern science converge at multiple conceptual points. While Ayurveda uses qualitative terms like *Guna* and *Dosha*, modern science explains the same phenomena using neural pathways and chemical messengers.[15]

Clinical Applications

Understanding *Nidra* and *Swapna* is clinically significant in both traditional and modern medicine. Ayurveda recommends various interventions such as:

- *Abhyanga* (oil massage)
- *Shirodhara* (stream pouring on the forehead)
- *Medhya Rasayana* (cognitive-enhancing formulations like *Mandukaparni*, *Yashtimadhu*)
- *Nidrajanaka Dravyas* (sleep inducing drugs such as *Tagara*, *Jatamansi*, *Ashwagandha*)
- *Satvavavajaya Chikitsa* (psychological counseling and support)

Modern treatments involve sleep hygiene education, behavioral therapy, pharmacological agents like melatonin agonists, and cognitive behavioral therapy for insomnia. Integrative approaches incorporating both sciences can offer sustainable solutions for sleep disorders and mental health issues.[16]

MODERN SCIENTIFIC REVIEW

Sleep is a complex and essential physiological process critical for survival and homeostasis. It constitutes approximately one-third of a human's life and is involved in numerous biological functions including tissue repair, cognitive processing, emotional regulation, and hormonal balance. Dreams are phenomena associated with specific stages of sleep and have been a subject of interest in psychology, neuroscience, and behavioral science for decades.[17]

Neurophysiology of Sleep

Sleep Architecture

Sleep is broadly divided into two main categories:

- **Non Rapid Eye Movement (NREM) Sleep**
    - Consists of stages 1 to 4
    - Stage 3 and 4 represent deep sleep or slow-wave sleep
    - Characterized by reduced physiological activity and brain wave slowing
- **Rapid Eye Movement (REM) Sleep**
    - Associated with rapid eye movements, vivid dreams, and heightened brain activity
    - Brain resembles a waking state on EEG
    - Plays a key role in memory consolidation and emotional integration

A typical adult cycles through NREM and REM sleep approximately every 90 minutes, completing 4 to 6 such cycles per night.

Neural Regulation of Sleep

The sleep-wake cycle is regulated by the suprachiasmatic nucleus (SCN) of the hypothalamus, which maintains the circadian rhythm in response to light-dark cues. The pineal gland

secretes melatonin, a hormone that promotes sleep.[18] Key neurotransmitters involved in sleep include:

- **Serotonin**: Initiates sleep
- **GABA**: Main inhibitory neurotransmitter; promotes relaxation
- **Acetylcholine**: Active during REM sleep
- **Orexin and histamine**: Promote wakefulness

The **brainstem**, **thalamus**, and **hypothalamus** form the core neuroanatomical circuit for sleep regulation.

Functions and Importance of Sleep

Sleep is critical for:

- **Physical restoration**: Tissue growth, muscle repair, and immune function
- **Cognitive function**: Memory consolidation, learning, attention, and problem-solving
- **Emotional regulation**: Processing and regulation of affective experiences
- **Metabolic regulation**: Hormonal balance, including insulin and cortisol
- **Neuroplasticity**: Strengthening of synaptic connections and neurogenesis

Sleep deprivation has been associated with a wide range of disorders including hypertension, obesity, diabetes, depression, anxiety, and cognitive decline.[19]

Sleep Disorders

Sleep disorders are categorized in the **International Classification of Sleep Disorders (ICSD-3)** and **DSM-5** as follows:

Category	Examples
Insomnia disorders	Chronic insomnia, short-term insomnia
Sleep-related breathing disorders	Obstructive sleep apnea, central apnea
Hypersomnolence disorders	Narcolepsy, idiopathic hypersomnia
Circadian rhythm disorders	Delayed sleep phase disorder
Parasomnias	Sleepwalking, night terrors, REM behavior disorder
Sleep movement disorders	Restless leg syndrome, periodic limb movement disorder

Treatment options include sleep hygiene, behavioral therapy (CBT-I), pharmacotherapy (benzodiazepines, non-benzodiazepine hypnotics), and devices like CPAP for apnea.

Modern Scientific Understanding of Dreams

Neurobiology of Dreams

Dreams predominantly occur during REM sleep and are associated with:

- **Activation of limbic system** (emotions)
- **Deactivation of dorsolateral prefrontal cortex** (logic and control)
- **Stimulation of the visual cortex** (imagery)
- **Role of acetylcholine and dopamine** in dream vividness and narrative complexity

Theories of Dreaming

Theory	Explanation
Activation Synthesis Theory	Dreams arise from random brainstem activity interpreted by the cortex
Information Processing Theory	Dreams help process memories and integrate emotions from waking life
Threat Simulation Theory	Dreams evolved to simulate real-life threats for adaptive preparedness
Continuity Hypothesis	Dreams reflect waking life thoughts, fears, and concerns
Cognitive Development Theory	Dreams reflect cognitive maturity and mental schema development

Clinical Relevance of Dreams

- **Nightmares and PTSD**: Dreams replay traumatic events; managed via imagery rehearsal therapy
- **Lucid dreaming**: Awareness during dreaming; potential role in creativity and therapy
- **REM sleep behavior disorder**: Early marker of neurodegenerative diseases like Parkinson's
- **Dream analysis in psychiatry**: Used in psychoanalysis to explore subconscious drives

Though modern science emphasizes biochemical and neurological mechanisms, dreams are also being studied in the context of psychological meaning, spiritual experiences, and consciousness studies. The growing interest in integrative models has revived cross-cultural and interdisciplinary studies linking ancient dream theories to neurocognitive science.[20]

NEUROPHYSIOLOGICAL PERSPECTIVES

Sleep is a dynamic and cyclic physiological state regulated by complex neural mechanisms. The suprachiasmatic nucleus (SCN) of the hypothalamus acts as the master clock, controlling the circadian rhythm in response to light and darkness. It communicates with the pineal gland, which secretes melatonin, a hormone that induces sleepiness, particularly at night. The brainstem, thalamus, cerebral cortex, and basal forebrain participate in initiating and maintaining sleep by modulating neurotransmitters such as serotonin, GABA, acetylcholine, histamine, and orexin. Together, these areas coordinate the sleep-wake cycle and influence transitions between different stages of sleep.[21]

Neuro-physiologically, sleep is divided into Non Rapid Eye Movement (NREM) and Rapid Eye Movement (REM) stages. NREM sleep includes four stages, with stages 3 and 4 being known as deep or slow-wave sleep (SWS), characterized by high amplitude delta waves on EEG. REM sleep, in contrast, is marked by rapid eye movements, muscle atonia, and EEG patterns similar to wakefulness. These stages alternate cyclically throughout the night in approximately 90-minute intervals. Each stage plays a distinct role: NREM sleep supports physical restoration and immune function, whereas REM sleep is essential for memory consolidation and emotional processing.[22]

The onset and maintenance of sleep involve an intricate balance between sleep-promoting and wake-promoting systems. GABA and galanin neurons from the ventrolateral preoptic nucleus (VLPO) inhibit wake-promoting neurons, allowing sleep to initiate. Orexin, produced by the hypothalamus, promotes arousal and prevents unwanted transitions into sleep, and its deficiency is implicated in narcolepsy. During REM sleep, acetylcholine levels increase, while serotonin and norepinephrine decrease. This neurochemical shift leads to vivid dreaming and cortical activation despite muscle paralysis. These neurotransmitter patterns explain the altered state of consciousness experienced during sleep and dreams.[23]

Dreams predominantly occur during REM sleep and are associated with high activity in the limbic system (amygdala, hippocampus), which governs emotions and memory. The

prefrontal cortex, responsible for logic and judgment, is relatively inactive during REM sleep, accounting for the often illogical and emotional nature of dreams. Theories such as the activation-synthesis hypothesis propose that dreams result from the brain's attempt to make sense of random neural activity. Others, like the memory consolidation theory, suggest dreams reflect the processing and integration of daytime experiences. Dream content is now also being studied for its potential clinical value in detecting neuropsychiatric and neurodegenerative disorders.[24]

RESULT AND FINDINGS

1. Both Ayurveda and modern science agree that *Nidra* (sleep) is essential for physical, mental, and emotional health.
2. Ayurvedic classifications like *Sharira Shrama Nidra* and *Tamobhava Nidra* align with modern causes such as physical fatigue and melatonin-driven sleep.
3. *Swapna* is described in Ayurveda as arising from *Samskaras* and *Dosha* imbalances, similar to modern theories attributing dreams to neural activity during REM sleep.
4. Ayurveda uses dreams for disease prediction, and modern medicine recognizes abnormal dreaming in neurological disorders like Parkinson's.
5. Ayurvedic therapies (e.g., *Abhyanga*, *Shirodhara*, *Medhya Rasayana*) can complement modern treatments like CBT I and melatonin for sleep disorders.
6. Combining Ayurvedic principles with modern tools may enhance personalized and holistic management of sleep and psychological health.

DISCUSSION

The review reveals that both Ayurvedic and modern perspectives recognize *Nidra* (sleep) as a fundamental biological necessity. Ayurveda places *Nidra* among the *Trayopastambha*, highlighting its role in maintaining health, strength, cognition, and emotional stability. Modern sleep science equally emphasizes its role in neurocognitive processing, immune function, and metabolic regulation. The Ayurvedic explanation of sleep arising from the dominance of *Tamas* and *Kapha* finds parallels in modern neurophysiology through melatonin secretion, GABAergic inhibition, and circadian rhythm regulation.[25]

Ayurveda offers a layered understanding of *Swapna* (dreams), viewing them as mental projections formed from residual experiences (*Samskaras*) or imbalanced *Doshas*. This aligns

with modern theories that describe dreams as cognitive phenomena emerging from limbic activation and subconscious emotional processing, primarily during REM sleep. Both systems identify dreams as reflecting inner psychological states, though Ayurveda uniquely extends this to include diagnostic and prognostic dimensions, especially in classical texts like *Indriya Sthana*.[26]

Ayurveda prescribes therapies such as *Abhyanga*, *Shirodhara*, *Snigdha Ahara*, and *Medhya Rasayana* for improving sleep quality and mental health. These interventions align well with non-pharmacological modern approaches like sleep hygiene, relaxation therapy, and cognitive behavioral therapy for insomnia. The possibility of using Ayurvedic dream analysis as a supportive psychological tool also opens avenues for integrative mental health approaches, especially in chronic insomnia, depression, or PTSD.[27]

The integration of Ayurvedic insights with neurophysiological evidence offers a broader, more holistic understanding of sleep and dreams. While Ayurveda emphasizes qualitative and individualized analysis, modern science brings quantifiable metrics through EEG, hormone assays, and imaging studies. Bridging these views can foster innovative diagnostic models and personalized treatment protocols. However, more interdisciplinary research, clinical trials, and validated tools are needed to translate Ayurvedic theories of *Nidra* and *Swapna* into contemporary clinical practice.[28]

CONCLUSION

The integrated review of *Nidra* and *Swapna* through Ayurvedic and modern neurophysiological perspectives reveals significant conceptual harmony and clinical relevance. Ayurveda emphasizes sleep as one of the three foundational supports of life and interprets dreams as reflections of mental and *doshic states*, while modern science explains sleep and dreams through neurochemical, structural, and cognitive mechanisms. Both systems recognize their essential role in maintaining physical, mental, and emotional health. The convergence of these ancient and contemporary views presents a unique opportunity to develop holistic, personalized, and integrative approaches for the prevention and management of sleep disorders and psychosomatic conditions.

CONFLICT OF INTEREST -NIL

SOURCE OF SUPPORT -NONE

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