

Nidra in Ayurveda and Modern Sleep Science: A Comparative Review of Physiological and Psychological Perspectives

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Abstract

Nidra (Sleep) is an essential physiological process necessary for maintaining physical health, mental stability, emotional balance, and cognitive efficiency. In contemporary medicine, sleep is recognized as a complex neurophysiological phenomenon regulated by circadian rhythms, neurotransmitters, and different stages of Non-Rapid Eye Movement (NREM) and Rapid Eye Movement (REM) sleep. (1) Disturbances in sleep are associated with several physical and psychological disorders.

Ayurveda considers Nidra (sleep) as one of the three fundamental pillars of life (Trayopastambha), along with Ahara (diet) and Brahmacharya (regulated lifestyle). Classical Ayurvedic texts describe Nidra as a natural physiological state produced by the interaction of Sharir and Manas Doshas, particularly Kapha and Tamas. Proper sleep contributes to physical health, mental well-being, balanced body constitution, vitality, and longevity. Ayurveda considers these qualities as indicators of holistic health and successful maintenance of bodily equilibrium (2). Whereas improper sleep leads to disease, debility, ignorance, and even death. Ayurveda also explains the types, causes, physiological effects, and disorders of sleep in detail, highlighting its psychological and somatic significance.

The present review aims to comparatively analyze the concept of Nidra described in Ayurveda with modern sleep science from physiological and psychological perspectives.

Keywords: Nidra, Trayopastambha, Sleep, psychological, physiological

Introduction

We are not even aware of how our lives are highly affected by some factors. Unless improper utilization causes some kind of pathology in our body. According to Ayurveda, there are three main factors affecting our body, i.e., Ahara (Food), Nidra (Sleep), and Brahmacharya (Celibacy), which are called Trayopastambha (3) and are the pillars of life. Ayurveda, the traditional system of Indian medicine, offers a holistic understanding of sleep through the concept of *Nidra*. With so much stress and worry in daily life, it can be hard to relax both physically and mentally. Getting enough sleep at the right time can help you find that relaxation. Sleep is a universal biological phenomenon essential for the survival and optimal functioning of the human body and mind.

According to Charaka Samhita, proper sleep brings happiness, nourishment, strength, virility, knowledge, and longevity, whereas improper sleep leads to misery, weakness, infertility, ignorance, and disease. The classical verse states:

“निद्रायत्तं सुखं दुःखं पुष्टिः कार्श्यं बलाबलम् |

वृषता क्लीबता ज्ञानमज्ञानं जीवितं न च ||३६||” (Ch Su 21/36)

This highlights the multidimensional importance of Nidra in maintaining both physical and psychological health. Ayurvedic literature further explains various types of Nidra, causes of sleep disturbances, effects of day sleep (Divaswapna), consequences of night awakening (Ratri Jagarana), and therapeutic measures for proper sleep. Sleep is understood not merely as a resting phase but as an active physiological state influenced by Doshas, especially Kapha Dosha and Tamo Guna. (4). Contemporary sleep science interprets sleep through neurophysiological mechanisms, including circadian rhythms, neurotransmitter activity, and distinct sleep stages such as rapid eye movement (REM) and non-REM sleep. (5,6). This review provides a comparative analysis of Ayurvedic and modern scientific perspectives on sleep, with a focus on physiological and psychological aspects.

Therefore, the present review is undertaken to comparatively study Nidra in Ayurveda and modern sleep science with special reference to physiological and psychological aspects. The review explores similarities and differences between Ayurvedic principles and contemporary neurophysiological understanding regarding sleep mechanisms, stages, functions, and health implications. Such an integrative approach may contribute toward holistic understanding and management of sleep-related disorders through combined traditional and modern perspectives.

Concept of Nidra in Ayurveda

Physiology of Nidra

According to the Sushruta Samhita, a living being's heart (Hridaya) is thought to be the seat of consciousness. Tamas, the quality connected to darkness and lethargy, takes over this center of consciousness. At that time, the body experiences nidra, or sleep. The text further states that *Tamas* is the principal factor responsible for inducing sleep, whereas *Sattva* is responsible for wakefulness and awareness. Additionally, natural physiological tendency (*Svabhava*) is described as an important causative factor in the occurrence of sleep. (8)

करणानां तु वैकल्ये तमसाऽभिप्रवर्धिते |

अस्वपन्नपि भूतात्मा प्रसुप्त इव चोच्यते ||Su.Sha.4/37

“Nidra occurs when the mind and sensory organs become fatigued and withdraw from their objects.” (9) According to Sushrut, dreams arise when the mind, influenced predominantly by Raja Guna during sleep, recollects and perceives previously experienced sensory impressions in the form of auspicious or inauspicious objects. (10)

Modern medicine defines sleep as a naturally recurring, reversible neurobehavioral state characterized by perceptual disengagement from and unresponsiveness to the environment, regulated by circadian and homeostatic mechanisms.(11)

According to modern science, some sleep centres' activity is what causes sleep. Sleep initiation and maintenance include intricate connections between the diencephalon, cerebral cortex, and reticular formation of the brainstem. Serotonin release. Non-REM sleep is induced by nerve fibres originating from the Raphe nucleus located in the lower pons and medulla, while REM sleep is produced when the locus

coeruleus of the pons is activated through the release of noradrenaline by nerve fibres originating from there.

Ayurvedic Perspective on Day Sleep (Divasvapna)(12)

Day sleep (Divasvapna) is generally contraindicated in all seasons except summer (Grīṣma Ritu).

Indications of Day Sleep / Divaswapna - However, even in conditions where day sleep is ordinarily prohibited, it is considered permissible for certain individuals, including children, the elderly, women, debilitated persons, those suffering from injuries, emaciation, exhaustion, habitual alcohol consumption, excessive travel, prolonged physical exertion, fasting, depletion of fat, sweat, Kapha, body fluids, or blood, as well as individuals with indigestion. For such persons, short-duration daytime sleep is not considered harmful.

Similarly, individuals who remain awake during the night are advised to compensate by sleeping during the daytime for half the duration of lost nocturnal sleep.

Disease occurs due to Day-Sleep -Divaswapna - Ayurveda considers day sleep as a causative factor for pathological disturbances when practiced improperly. Excessive or inappropriate daytime sleep leads to vitiation of all the Doshas and disturbance of normal physiological functions. As a consequence, disorders such as cough (Kasa), dyspnoea, rhinitis, heaviness of the head, body ache, anorexia, fever, and diminished digestive power may develop. Conversely, excessive night awakening primarily aggravates Vata and Pitta Doshas and produces similar complications.

Modern Sleep Science

Physiology of Sleep

Modern science explains the physiology of sleep as a natural process controlled by the brain, nervous system, hormones, and body clock. Sleep helps the body and mind rest, repair, and function properly.

Two main systems regulate sleep:

1. Circadian rhythm – the body's internal clock that controls the sleep–wake cycle according to day and night.
2. Sleep drive (homeostatic mechanism) – the longer a person stays awake, the stronger the need for sleep becomes.

The brain controls sleep through various neurotransmitters. Melatonin helps regulate the sleep cycle, while GABA promotes relaxation and sleep onset. During sleep, the body passes through two major stages:

- Non-REM sleep (non-rapid eye movement NREM): important for physical rest, tissue repair, energy conservation, and immune function.
- REM sleep (rapid eye movement): associated with dreaming, memory consolidation, learning, and emotional processing.

During sleep, heart rate, blood pressure, breathing rate, and muscle activity decrease, allowing the body and brain to recover and maintain normal functioning. (13,14)

Classification of Sleep Stages

1. Non-REM (NREM) Sleep- NREM sleep has **three stages**:

- a) Stage N1 – Light sleep
- b) Stage N2 – Deeper light sleep
- c) Stage N3 – Deep sleep (slow-wave sleep)

2. REM Sleep - This is the dream sleep stage.

Sleep Cycle

A normal sleep cycle follows this order:

N1 → N2 → N3 → N2 → REM, Then the cycle repeats.

• **Summary Table of Sleep Stages**

Stage	Type of Sleep	Main Features	Importance
N1	Light sleep	Transition to sleep	Relaxation
N2	Moderate sleep	Sleep spindles, lower body activity	Memory and energy conservation
N3	Deep sleep	Delta waves are difficult to awaken	Physical restoration
REM	Dream sleep	Rapid eye movement, vivid dreams	Mental restoration

Comparative Physiological Perspectives

	Ayurvedic Perspective	Modern Sleep Science Perspective
1.	Nidra is governed by Doshas and Trigunas	Sleep is regulated by neurochemical and circadian mechanisms
2.	Kapha promotes sleep stability	Parasympathetic dominance facilitates sleep
3	Vata aggravation causes insomnia	Hyperarousal and sympathetic activation cause insomnia
4.	Tamas induces sleep	Reduced cortical activation promotes sleep onset
5.	Proper Nidra nourishes tissues (<i>Dhatus</i>)	Sleep supports tissue repair and glymphatic clearance
6.	Dinacharya regulates sleep timing	Circadian rhythm synchronizes sleep-wake cycles

Ayurvedic emphasis on balance and rhythm parallels modern chronobiology. Both systems recognize the restorative and regulatory importance of sleep for physiological homeostasis.

Showing types of Nidra according to Brihatrayi

Sr. No.	Charaka Samhita (15)	Ashtanga Hridaya (16)	Sushruta Samhita(17)
1	Tamobhava Nidra	Tamobhava Nidra	Vaishnavi Nidra
2	Shleshma Samudbhava Nidra	Shleshma Samudbhava Nidra	Tamsi Nidra
3	Mana Sharira Shrama Sambhava Nidra	Mana Sharira Shrama Sambhava Nidra	Vaikariki Nidra
4	Agantuki Nidra	Agantuki Nidra	
5	Vyadhi Anuvartini Nidra	Vyadhi Anuvartini Nidra	—
6	Ratri Svabhava Prabhava Nidra	Ratri Svabhava Prabhava Nidra	—

Diseases caused by improper sleep

Improper and untimely sleep leads to numerous disorders in the body. These diseases are psychosomatic in nature. According to Acharya Vagbhat, diseases like Halimaka (a kind of jaundice), headache, heaviness of body, fever, giddiness, mental disturbance, obstruction of channels, diminution of Agni (digestive fire), edema, tastelessness, Nausea, Rhinitis, itching, body ache, urticaria, ulcers, cough, drowsiness, disease of throat, and features of poisoning. Also, excessive sleep and daytime sleep is the root cause of various diseases. Hence, daytime sleep bus is contraindicated in many diseases by the Acharyas.(18)

Nidra / Sleep-Adharneeya Vega/ suppression of the urge to sleep -By suppression of sleep, yawning, body-ache, stupor/drowsiness, head disorders, and feeling of heaviness in the eyes are caused, for which sleep and gently pressing the body (massaging the body by hand or mild trampling by feet) are recommended.(19)

Ahara and Vihara are to be followed for sound sleep-

Insomnia or disturbed sleep is one of the most worrisome ailments nowadays due to the extreme. Working conditions and excessive mental stress. In Ayurveda lifestyle changes have been suggested by the Acharyas in terms of Ahara and Vihara to induce sound sleep, which are Massage, unctious bath, soup of domestic, marshy and Aquatic animals, Shali Rice with curd, unctuous substance, milk, alcohol and psychic pleasure, smell of scents and hearing of sounds of ones own taste, comfortable touch, application of anointments to the body, Tarpana process for eyes, comfortable bed, home and sleeping at proper time.(20) In modern science, the food that induces sleep should usually be rich in tryptophan, which includes banana, milk, poultry, spinach, seafood, almonds, walnuts, etc.

Sleep Disorders: Ayurvedic and Modern Correlation

Anidra/Nidranasha (Insomnia)

Ayurveda describes *Anidra* as inadequate or disturbed sleep resulting primarily from aggravated Vata and Pitta Doshas. (21) Causes include Stress, Improper diet, excessive mental activity, Irregular lifestyle, and emotional disturbances. Symptoms include fatigue, irritability, poor concentration, anxiety, and bodily weakness. Modern medicine similarly defines insomnia as difficulty initiating or maintaining sleep associated with daytime impairment.

Psychological Perspectives of Sleep

Ayurveda and Mental Health

Ayurveda considers sleep essential for mental equilibrium. Disturbed sleep affects Memory, Emotional stability, concentration, Cognitive performance Psychological resilience. Mental disturbances involving excessive Rajas and Vata are believed to contribute to anxiety, fear, overthinking, and insomnia. Dreams (*Swapna*) are also psychologically significant in Ayurveda. Different dream patterns are associated with Dosha predominance. Vata dreams: unstable and fearful, Pitta dreams: vivid and intense, Kapha dreams: calm and slow.

Modern Psychological Perspectives

Modern psychology recognizes sleep as essential for Emotional regulation, Memory consolidation, Learning, and executive functioning. Stress adaptation REM sleep particularly contributes to emotional processing and consolidation of affective memories. Chronic sleep deprivation is strongly associated with Anxiety disorders, Depression, Cognitive decline, and mood instability. Contemporary neuroscience also links sleep disturbances to dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis and elevated cortisol levels.

Integrative Therapeutic Approaches

Ayurveda recommends holistic sleep management strategies, including:

- Dinacharya (daily routine)
- Meditation
- Abhyanga (oil massage)

- Herbal therapies
- Shirodhara
- Nasya therapy
- Dietary regulation

Recent integrative studies suggest these therapies may influence autonomic balance, cortisol regulation, and neurotransmitter function.

Modern sleep hygiene recommendations similarly emphasize:

- Regular sleep schedules
- Reduced screen exposure
- Stress reduction
- Behavioral therapy
- Circadian alignment

Yoga Nidra and non-sleep deep rest (NSDR) practices are increasingly explored as complementary techniques for stress reduction and nervous system regulation. Community discussions suggest such practices may improve subjective restfulness and relaxation, although they do not replace physiological sleep requirements.

Discussion

Ayurveda and modern sleep science originate from different epistemological systems, yet both recognize sleep as central to physical and psychological health. Ayurveda offers a personalized and holistic framework emphasizing constitutional balance, lifestyle regulation, and mind-body integration. Modern science provides detailed mechanistic insights into neurophysiology, circadian biology, and cognitive function.

The Ayurvedic understanding of Doshas and Trigunas can be interpreted metaphorically alongside modern concepts such as autonomic regulation, arousal systems, and behavioral neuroscience. Integrative perspectives may enhance current approaches to insomnia, stress-related disorders, and lifestyle diseases. Further interdisciplinary research is necessary to scientifically validate Ayurvedic sleep interventions and establish evidence-based integrative models.

Conclusion

Despite differences in theoretical frameworks, substantial conceptual overlap exists between the two systems. Integrating Ayurvedic principles with modern sleep science may contribute to more comprehensive and individualized approaches for promoting healthy sleep and managing sleep disorders. Sleep is not viewed merely as a passive resting state but as an important determinant of constitutional balance, health, and disease. Ayurveda recognizes both excessive sleep and insufficient sleep as pathological conditions associated with Doshic imbalance. Proper understanding of the indications, contraindications, causative factors, and management of sleep disturbances is considered essential for maintaining physiological and psychological well-being.

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