

# A Review of Physiological Changes in Night Shift Workers in Relation to *Nidra Vega Dharana*

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## ABSTRACT

This literature review explores the physiological changes related to working night shifts, specifically focusing on the concept of *Nidra Vega Dharana* (suppression of the natural urge to sleep). The review synthesises findings from various studies and classical Ayurvedic texts, highlighting the significant health implications of disrupted sleep patterns and circadian rhythms among night shift workers. The paper discusses how the misalignment of work schedules with the body's natural circadian rhythms leads to various physiological stress responses, including sleep deprivation, increased fatigue, and heightened risk of developing chronic health conditions, such as metabolic disorders, cardiovascular diseases, and psychological issues. It emphasises the critical role of *Nidra* (sleep), which is essential for physical and mental rejuvenation and preserving general health and wellness. Furthermore, this review examines the adverse effects of *Nidra Vega Dharana*, which can result in various symptoms such as *Tandra* (drowsiness), *Angamarda* (body aches), and cognitive impairments, as described in classical texts. The relationship between *Nidra* and the balance of the *Tridosha* (*Vata*, *Pitta*, and *Kapha*) is also explored, illustrating how sleep suppression can lead to *Dosha* imbalances and subsequent health issues. By integrating traditional Ayurvedic perspectives with contemporary research, this review seeks to offer a thorough understanding of the physiological challenges faced by night shift workers and the importance of addressing *Nidra Vega Dharana* to promote better health outcomes.

**Keywords:** *Nidra Vega Dharana*, Night shift work, *Nidra* (Sleep), Circadian rhythms, *Tridosha*,

## INTRODUCTION

*Nidra* (sleep) is a physiological state in which there is temporary inactivity of *Jnanendriya* (sense perception) as well as *Karmendriya* (motor organs) [1]. It is considered to be one of the fundamental sub-pillars (*Upastambha Traya*), offering relief and recuperation for the disturbed fatigue of the mind, senses, and body caused by the demands of everyday living [2]. Unlike modern Western medicine, which views sleep as a state of inactivity, *Ayurveda* views *Nidra* (sleep) as an active process necessary

for the body's balance and rejuvenation [3]. To maintain positive health, our ancient *Acharyas* have presented various concepts, including *Prakriti*, *Dincharya*, *Ritucharya*, and *Adharniya Vega* etc. Among these, *Adharniya Vega* (The suppression of natural urges) is also a crucial concept in *Ayurveda*. This is because all the ancient *Acharyas* have elaborated on this principle, while modern science tends to overlook its significance [4]. *Nidra Vega Dharana*, the suppression of the natural urge to sleep, is a concept deeply rooted in *Ayurveda*. This practice, often

unintentional due to modern lifestyle demands, is particularly prevalent among shift workers & has significant implications for physical and mental well-being [5][6]. Night shift work is a prevalent characteristic of modern industrialised societies, compelling individuals to perform tasks outside of their natural circadian rhythms. This disruption has significant and well-documented implications for health. Numerous studies have identified the adverse effects of night shift work on various physiological factors. A considerable portion of these effects is attributed to the disruption of the circadian rhythm, which serves as the body's internal clock and regulates numerous bodily functions [7] [8]. The manifestation of this disruption varies among individuals and is influenced by factors such as the type of night shift work and the duration of exposure. This study examines the physiological explanations for both established and newly observed local and systemic effects of *Nidra Vega Dharana*. A systematic review of the existing literature was done, comparing findings and identifying research gaps to offer a comprehensive understanding of this important health issue.

## METHODOLOGY

Numerous facets of *Nidra Vega Dharana* are examined in this review study. Classical *Ayurvedic* texts such as the *Charak Samhita*, *Sushruta Samhita*, and *Astanga Hridaya*, as well as commentaries like *Ayurved Dipika Teeka* by *Chakrapani*, *Nibandh Sangraha Teeka* by *Dalhana*, *Sarvang Sundara Teeka* by *Arundatta*, and *Bhavparkash Nighantu*, were examined for their references to *Nidra Vega Dharana*, *Ratrijagarana*, and other *Nidra* (sleep) related topics. Literature from *Ayurveda* and contemporary science was collected from online sources, journals, and books. These theoretical resources from two distinct domains were compared and examined closely.

## IMPORTANCE OF NIDRA (Sleep):

*Sukha* (Pleasure), *Pushti* (Nourishment and growth), *Bala* (Strength and immunity),

*Vrishataa* (Potency and sexual vigor), *Jnanan* (Knowledge and intellect), and *Jeevitam* (Good lifespan, longevity of life) represent the desired impacts of *Samyaka Nidra* (Proper Sleep). A person experiencing *Asamyak Nidra* (improper sleep) will suffer from *Dukkha* (unhappiness), *Karshya* (Emaciation), *Abala* (weakness), *Klibata* (impotence), *Ajnanan* (illiteracy), and *Ajivita* (death). If sleep is properly enjoyed, it can bring happiness and longevity to a person's life. Just as true knowledge brings spiritual power to a *Yogi* [10]. Contemporary science also mentions that adequate sleep is crucial for maintaining overall health and well-being. One of the primary benefits of sufficient sleep is its impact on cognitive function. Research shows that adequate sleep improves memory consolidation, problem-solving abilities, and overall cognitive performance [11]. Additionally, adequate sleep is essential for physical health. It supports immune function, as studies have shown that people who do not get enough sleep are more vulnerable to infections and illnesses [12].

## Concept of Vega (Natural Urges)

*Vega* represents the release of natural urges, such as the need to urinate or defecate [13]. It can be defined as the phenomenon that occurs just before the onset of a process and can be considered the external manifestation of an internal stimulus [4]. *Ayurveda* has described two types of natural *Vega* (urges): *Dharaniya* (suppressible urges) and *Adharaniya* (nonsuppressible urges). *Lobha* (Greediness), *Shoka* (Depression), *Bhaya* (Fearfulness), *Krodha* (Anger), *Irshya* (Jealousy), *Kaama* (Shamelessness), *Ahankara* (Ego), *Atyanta Kathora Vachana* (Unpleasing talks), *Anvrut* (To tell lies) *Vakyasya Akalyukt* (Untimely talks) *Para-Pida* or *Himsa* (Trouble to others) *Para-Stri Samboga* (Indulge in sexual intercourse to other than his wife) *Steya* (Theft) are mentioned in *Dharaniya Vega* (suppressible urges) [14]. To maintain good health, a person should make an effort to avoid harmful actions in their *Manasika* (thoughts),

*Vaachika* (words), and *Sharirika* (physical) deeds [14].

*Adharaniya Vega* (Non Suppressible urges) includes: *Mootra Vega* (Urge of urination), *Pureesha Vega* ( Urge of defecation), *Retas Vega* (Urge of ejaculation/sexual expression), *Apanavayu Vega* (Urge of farting), *Vamana Vega* (Urge of vomiting), *Ksavathu Vega* (Urge of sneezing), *Udgara Vega* (Urge of belching) *Jrumbha Vega* (Urge of yawning), *Kshudha Vega* (Urge of hunger), *Pipaasa Vega* (Urge of thirst), *Vaspha/Ashru Vega* (Urge of lacrimation), *Shrama Janya Shwasa Vega* (Urge of breath on exertion) & *Nidra Vega* ( Urge of sleeping)[15][16]. These natural urges should never be suppressed, as doing so regularly can lead to various health problems.[15]

### **Nidra Vega Dharana and Associated Health Issues**

Night shift work has received increased attention in recent years, especially in the context of globalisation and the 24/7 economy. In India, the prevalence of night shifts has risen significantly, driven by the growth of industries such as information technology, manufacturing, and healthcare, which often require continuous operations to meet global demands. According to the International Labour Organization (ILO), approximately 20% of the global workforce is engaged in night shift work, a trend mirrored in India [17]. *Nidra* (Sleep) is known for being an instinctive desire. When this drive is suppressed, several issues occur. Table 1 presents the effects of *Nidra Vega Dharana* (suppression of the natural urge to sleep) as mentioned in classical *Ayurvedic* texts by various *Acharyas*.

**Table no. 1: Effects of Nidra Vega Dharana**

Symptoms	Ch.S. [18]	Su. S. [19]	A. S. [20]	A. H. [21]	B. P. [22]
<i>Jrumbha</i> (yawning)	+	+	+	+	+
<i>Angamarda</i> (Bodyache)	+	+	+	+	+
<i>Tandra</i> (Drowsiness)	+	+	-	-	+
<i>Shiroroga</i> (Disease related to head)	+	-	-	-	-
<i>Shiroruja</i> (Headache)	-	-	-	-	-
<i>Akshigaurva</i> (Heaviness in eye)	+	-	+	+	+
<i>AkshiJadya</i> (Dullness in eyes)	-	+	-	-	-
<i>Anga Jadyam</i> (Stiffness in body)	-	+	-	-	-
<i>Shiro Jadyam</i> (Dullness in head)	-	+	-	-	-
<i>Murdhagaurav</i> (Heaviness in head)	-	-	+	+	+
<i>Moha</i> (Delusion)	-	-	+	+	-
<i>Alasyam</i> (Lethargy)	-	-	+	-	-
<i>Anna Apaka</i> (Indigestion)	-	-	-	-	+

\* Ch. S.: *Charaka Samhita*

\* Su. S.: *Sushruta Samhita*

\* A. S.: *Ashtang Sangraha*

\* A. H.: *Ashtang Hridaya*

\* B. P.: *Bhavprakash*

Table 1 illustrates that symptom such as yawning, body aches, drowsiness, headaches, stiffness, and indigestion are common manifestations resulting from the suppression of the urge to sleep. These symptoms arise because *Vegotpatti* is a function of *Vata dosha*, and the suppression of natural urges (*Vegadharana*) leads to the vitiation of *Vata*. This disturbed *Vata dosha* can further disrupt *Kapha* and *Pitta doshas*,

as well as other bodily elements like *Vid* (stool) and *Mutra* (urine), ultimately causing diseases across all bodily systems (*Roga Marga*) [23]. *Ayurveda* also describes the negative effects of *Ratrijagarana* (working or being awake at night), which leads to *Rukshta* (roughness in the body) due to the aggravation of *Vata dosha* [24].

## **The impact of Nidra Vega Dharana on different body systems:**

### **1. Digestive system:**

The human digestive system functions on a circadian rhythm that regulates various physiological processes, including digestion, metabolism, and gut motility. However, working night shifts disrupts this natural rhythm. This misalignment can lead to gastrointestinal issues such as dyspepsia, bloating, and changes in bowel habits [25]. Disruption of the circadian rhythm can lead to changes in the gut microbiome, potentially increasing the risk of gastrointestinal diseases and metabolic disorders [26]. In *Ayurveda*, *Acharya Charak* said that even if one has taken healthy food, proper digestion does not take place due to *Jagarana* (Awakening in the night) [27]. Staying awake late at night (around 2 am to 6 am) in *Vata Kala* (Time when *Vata Dosha* is dominant) can aggravate *Vata*, which in turn affects the *Agni* (Digestive fire) and leads to improper digestion of food. The disturbance of *Vata* has a more negative impact on digestion than *Pitta* and *Kapha*[28].

### **2. Reproductive System:**

In *Ayurveda*, it is noted that improper *Nidra* (sleep) can lead to *Klibata* (impotence) [9]. A study indicates that changes to the circadian rhythm can impact reproductive health and lead to irregular menstrual cycles [29]. The circadian peripheral clocks are negatively impacted by the desynchronisation of changed light exposure, which delays puberty and impairs ovulation, sperm production, implantation, and pregnancy development [30]. *Nidra* greatly enhances hormone profiles in women with menstrual abnormalities by the reduction of thyroid-stimulating hormone follicle-stimulating hormone, luteinising hormone, and prolactin levels [31]

### **3. Musculoskeletal system:**

Research shows that working night shifts raises the risk of developing musculoskeletal disorders and pain [32][33]. In *Ayurveda*, it is observed that *Nidra Vega Dharana*

(suppressing the urge to sleep) can lead to various issues, including *Angamarda* (Body aches), *Akshigaurva* (Heaviness in the eyes), and *Anga Jadyam* (Stiffness in the body), which can be linked to muscle impairment.

### **4. Sleep Disturbances:**

*Ayurveda* identifies *Karya* (workload) and *Kala* (the inappropriate time for sleep) as the main causes of *Nidranasha* (insomnia) [34]. *Karya* can be associated with night shift work. The night shift workers frequently awaken at night and sleep in the morning, which disturbs their sleep patterns. One of the most consistently reported physiological changes is sleep disruption. Night shift workers frequently experience poor sleep quality [35], insomnia [36], and daytime sleepiness [37]. Night shift workers are at risk of developing health problems due to a conflict with the body's biological clock. Shift Work Sleep Disorder (SWSD) is one such circadian sleep disorder characterised by difficulty in initiating and maintaining sleep, excessive sleepiness or both [38]. *Acharya Sushruta* advises that a person who misses sleep at night should consume half the amount of sleep they missed [39].

### **5. Immune System:**

The immune system appears to be vulnerable to the effects of night shift work. Studies indicate that night shift workers may have higher levels of circulating white blood cells (WBCs), which could be linked to an increased risk of chronic disease [40]. This dysfunction of the immune system may increase vulnerability to infections and various health issues [41]. *Acharya Charaka* states that improper sleep negatively impacts the body and leads to *Abala*, which can refer to a loss of strength or immunity [9]. *Acharya Vagbhatta* states that individuals who practice *Akalashayana* (sleeping at inappropriate times) are more likely to experience *Javra* (fever) [42].

### **6. Metabolic effects:**

The conditions of *Stholya* (obesity) and *Karshya* (emaciation) are influenced by both

*Ahara* (nutrition) and *Nidra* (sleep)[43]. Individuals who experience *Asamayaka Nidra* (improper sleep) are more likely to exhibit signs of *Karshyata* (emaciation) in their bodies [9]. The disruption of circadian rhythms leads to alterations in glucose metabolism and insulin sensitivity [44]. Studies have shown an increased prevalence of insulin resistance [45] and glucose tolerance [44] among night shift workers. Lipid profiles can undergo significant changes, as research has shown a rise in triglycerides alongside a drop in high-density lipoprotein (HDL) cholesterol [46][47].

### 7. Effects on mental health:

Night awakening (*Ratrijagarana*) can significantly impact an individual's mental state (*Manhika Bhava*). *Acharya Charaka* states that individuals with *Asamyaka Nidra* (improper sleep) are more likely to experience *Dukha* (unhappiness) in their lives [9]. *Acharya Vagbhatta* mentioned *Moha* (delusion) as a symptom of suppressing the urge to sleep [21]. Modern studies have shown that night shift workers are at a higher risk of developing mood disorders, including depression and anxiety. A meta-analysis found that shift work, particularly night shifts, is linked to a higher prevalence of depressive symptoms compared to day workers [48]. Continuous rotational work negatively impacts the nervous system and may hasten the onset of psychiatric disorders, such as bipolar disorder, schizophrenia, and major depressive disorder [49]. Research has shown that shift work and disrupted sleep can quickly reduce cognitive performance [50], potentially leading to increased mistakes and accidents in the workplace.

## DISCUSSION

*Nidra* (sleep) is a physiological state characterised by temporary inactivity of the senses and motor organs. In Ayurveda, it is considered essential for revitalisation and equilibrium. *Adharneeya Vega* (the suppression of natural urges), including *Nidra Vega Dharana*, is a crucial Ayurvedic

concept often overlooked in modern science. Night shift work, prevalent in industrialised societies, forces individuals to operate outside their natural circadian rhythms, leading to well-documented health consequences. These effects are largely attributed to circadian rhythm disruption, which regulates numerous bodily functions. This literature review explores the physiological consequences of night shift work, focusing on the *Ayurvedic* concept of *Nidra Vega Dharana* (The suppression of the natural urge to sleep). It synthesises findings from various studies and classical *Ayurvedic* texts, highlighting the significant health implications of disrupted sleep patterns and circadian rhythms among night shift workers. The misalignment of work schedules with the body's natural circadian rhythms leads to physiological stress responses, including sleep deprivation, increased fatigue, and a heightened risk of chronic health conditions such as metabolic disorders, cardiovascular diseases, and psychological issues. The review emphasises the importance of *Nidra* (sleep) for physical and mental rejuvenation, as described in *Ayurvedic* literature. The adverse effects of *Nidra Vega Dharana*, such as drowsiness, body aches, and cognitive impairments, are also examined, referencing classical texts. This review systematically examines the physiological explanations for the local and systemic effects of *Nidra Vega Dharana*, comparing findings and identifying research gaps.

The findings underscore the need for effective management strategies and organisational policies that prioritise the health and well-being of night shift workers, advocating for improved sleep hygiene and lifestyle modifications.

### Mitigation Strategies for Night Shift Workers:

*Nidra Vega Dharana* requires a multifaceted approach that blends modern and traditional knowledge. Various strategies appear to hold promise:

**Improved sleep hygiene:** Establishing healthy sleep habits such as maintaining a regular sleep schedule, creating a comfortable sleep environment, and avoiding caffeine and alcohol before bedtime can help reduce the negative effects of sleep deprivation [51].

**Chronotherapy and Chronoclinics:** Implementing chronotherapy, which involves adjusting sleep schedules and lifestyle to align with the body's natural rhythms, and establishing Chronoclinics, specialised clinics focusing on circadian rhythm disorders, are crucial for managing sleep problems in shift workers [51].

**Yoga Nidra:** This relaxation technique has been shown to reduce stress and enhance sleep quality effectively [52], potentially alleviating the adverse effects associated with *Nidra Vega Dharana*.

**Ayurvedic Lifestyle Practices:** *Dinacharya* (daily routine) and *Ratricharya* (nightly routine), as described in *Ayurvedic* texts, offer guidelines for maintaining a healthy sleep-wake cycle [53]. If practised diligently, these methods may help prevent *Nidra Vega Dharana* and its related health issues.

**Need of Government initiatives:** The government should implement policies to monitor employees' sleep levels through primary healthcare centres (PHCs), ensuring the well-being of individuals and their families and enhancing staff creativity.

## CONCLUSION

This article explores the effects of *Nidra Vega Dharana* (suppression of the natural urge to sleep) on various body systems, including the digestive, reproductive, musculoskeletal, and immune systems. It also examines how it impacts sleep patterns, metabolic health, and mental well-being. The review combines *Ayurvedic* and contemporary scientific insights to provide a comprehensive understanding of the physiological challenges night shift workers

face. This emphasises the importance of effective management strategies and organisational policies that prioritise the health and well-being of these workers. Additionally, the study highlights the need for further research to investigate the long-term consequences of *Nidra Vega Dharana* and to develop targeted interventions to mitigate the negative health impacts associated with night shift work.

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