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Ayurveda

ADVERSE EFFECTS OF SUPPRESSION OF SLEEP URGE (NIDRA-VEGA-DHARANA) AND ITS DIRECTAND INDIRECT ROLE IN AGGRAVATING NCD RISK FACTORS

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ABSTRACT **Background:** In Ayurveda, sleep (Nidra) is recognised as one of the three vital pillars (Trayopastambha) essential for physiological stability, cognitive functioning, and emotional well-being. Suppression of the natural sleep urge (Nidra-Vega-Dharana), considered an Adharaniya Vega, is described as a significant cause of systemic imbalance leading to disease. In modern lifestyles marked by late-night screen use, shift work, and behavioural stress, habitual sleep-urge suppression has become increasingly prevalent. Biomedical research strongly correlates inadequate or disrupted sleep with major Non-Communicable Disease (NCD) risk factors such as metabolic syndrome, hypertension, obesity, insulin resistance, and chronic inflammation. **Aim:** To analyse the Ayurvedic concept of Nidra-Vega-Dharana and evaluate its direct and indirect contributions to NCD risk using classical references and modern scientific evidence. **Methods:** A conceptual and narrative review approach was employed. Classical Ayurvedic texts, contemporary conceptual papers, and modern biomedical studies on sleep physiology, circadian disruption, neuroendocrine changes, inflammation, oxidative stress, and NCD epidemiology were systematically examined and synthesised. **Results:** Findings demonstrate that suppression of the sleep urge initiates a cascade of disturbances including Vāta prakopa, Agni-mandya, metabolic dysregulation, HPA-axis hyperactivity, inflammatory activation, and circadian misalignment. These changes parallel established mechanisms underlying NCDs, indicating that Nidra-Vega-Dharana contributes substantially to disease risk. **Conclusion:** Nidra-Vega-Dharana emerges as an independent, modifiable behavioural determinant associated with heightened NCD susceptibility. Integrating Ayurvedic sleep-health principles into preventive healthcare and lifestyle counselling may serve as a valuable strategy in reducing NCD burden.

KEYWORDS : Nidra-Vega-Dharana, Sleep Suppression, Non-Communicable Diseases (NCDs), Circadian Disruption, Metabolic Syndrome etc.

1. INTRODUCTION:

1.1 Nidra as a Fundamental Pillar of Health:

Sleep (Nidra) is described as one of the Trayopastambha, the three essential pillars sustaining lifealong with Ahara (diet) and Brahmacharya (regulated conduct). Classical Ayurvedic texts emphasise that appropriate onset, duration, and quality of sleep are indispensable for maintaining the equilibrium of Sharira (body), Manas (mind), vitality, cognition, and psychological well-being. According to Charaka, properly indulged sleep bestows Sukha, Pushti, Bala, Vrsti, Jnana, and Jeevitacomfort, nourishment, strength, reproductive vitality, knowledge, and longevitywhile disturbed sleep results in opposite outcomes including debility and disease [1].Ayurvedic physiology describes Nidra as a natural state occurring when Tamo-guna predominates and Kapha nourishes and relaxes the senses, thereby withdrawing the mind from external stimuli [2,3].

1.2 Modern Understanding of Sleep Physiology:

Contemporary biomedical science strongly supports these ancient explanations. Sleep is now recognised as a complex neuro-physiological process essential for memory consolidation, synaptic repair, emotional processing, immune modulation, and endocrine stability [4]. Chronic sleep insufficiency is associated with metabolic syndrome, dyslipidaemia, insulin resistance, hypertension, cardiovascular disease, obesity, depression, impaired cognition, and increased mortality [5].Various epidemiological studies demonstrate that individuals with poor sleep quality are significantly more prone to developing major Non-Communicable Disease (NCD) risk factors. This has been confirmed by multiple sleep-behaviour surveys and physiological studies included in the uploaded literature [6].

1.3 Nidra-Vega-Dharana: The Ayurvedic View on Suppressing Sleep Urge:

Ayurveda classifies natural urges as Vega, and strongly cautions against suppressing Adharniya Vegas (non-suppressible urges). Nidra-Vega-Dharanathe intentional or habitual suppression of the natural urge to sleepis considered a potent cause of multiple systemic disorders. Classical treatises list consequences including Jrmbha (repeated yawning), Manda-jnana (reduced intellect), Angamarda (body ache), Tandra (drowsiness), heaviness of eyes, confusion, dryness, poor digestion, and sensory impairment [1–3].These symptoms reflect early Vata prakopa, representing a disturbance of neurological and psychological homeostasis. Ayurvedic reviews describe that prolonged Vega-Dharana affects cardiovascular, respiratory, gastrointestinal, urinary, nervous, endocrine, and musculoskeletal systems, ultimately contributing to chronic disease states [7].

1.4 Biomedical Parallels: Sleep Suppression and Systemic Pathophysiology:

From a biomedical standpoint, suppression of the natural sleep urge closely mirrors the pathological consequences of chronic sleep deprivation. Resistance to physiological sleep results in activation of the hypothalamic-pituitary-adrenal (HPA) axis, elevated cortisol levels, and sympathetic dominance [8]. Persistent sleep loss alters hormonal balance by decreasing leptin, increasing ghrelin, promoting impulsive eating behaviours, and impairing satiety control. Simultaneously, inflammatory mediators such as IL-6 and TNF-α increase, thereby contributing to metabolic derangement. Sleep suppression also disrupts circadian genes (CLOCK, BMAL1), impairing glucose tolerance, altering blood pressure regulation, modifying gut microbiota, and increasing oxidative stress—all of which accelerate the risk of developing NCDs [9].

1.5 Evidence from Shift-Work and Sleep Behaviour Studies:

Night-shift workers provide real-world evidence of chronic Nidra-Vega-Dharana. Studies report high prevalence of fatigue, gastric disturbances, hypertension, anxiety, mood imbalance, impaired glucose metabolism, weight gain, and cardiovascular strain among night-duty professionals [10].Physiological studies specifically examining Nidra-Vega-Dharana highlight parallels between classical Ayurvedic symptoms and modern sleep deprivation outcomes, strengthening the Ayurvedic–biomedical correlation [7].

1.6 NCD Burden and Relevance of Sleep Suppression:

Non-Communicable Diseases remain the leading global cause of mortality, contributing to 71% of total deaths annually. Cardiovascular diseases, diabetes, chronic respiratory diseases, and cancers account for most of this burden, with modifiable behavioural factors—including poor sleep—playing a significant role. Increasing workloads, excessive screen exposure, shift work, social pressures, and unhealthy lifestyles have normalized chronic sleep suppression in modern society, making Nidra-Vega-Dharana more prevalent than ever.

Ayurveda deepens this understanding by associating Nidra-Vega-Dharana with Prajnaparadha (errors of intellect), Agni-mandya (digestive impairment), Vata-vitiation, and Srotorodha (microchannel obstruction) [1–3]. These mechanisms correspond closely with stress biology, metabolic dysregulation, and chronic low-grade inflammation described in modern NCD science.

1.7 Rationale and Research Gap:

Although several studies have examined sleep physiology, Vega-Dharana, and the impact of shift work independently, there is a

substantial gap in synthesising these domains to understand how Nidra-Vega-Dharana specifically contributes to NCD development.
Current research fails to identify sleep-urge suppression as a standalone behavioural risk factor; instead, it is often grouped under insomnia or general sleep deprivation.

1.8 Purpose of the Study:

This article therefore aims to integrate classical Ayurvedic doctrine with modern physiological, epidemiological, and clinical evidence to illustrate the direct and indirect mechanisms through which Nidra-Vega-Dharana increases NCD risk. It further seeks to highlight the importance of recognising sleep-urge suppression as an independent modifiable factor within preventive, promotive, and public health frameworks.

2. REVIEW OF LITERATURE:

2.1 Classical Concept of Nidra:

Ayurvedic classics describe Nidra as a natural physiological state essential for the maintenance of life and health. In Charaka Samhita, Nidra is defined as the state that arises when the mind and sense organs withdraw after fatigue, granting rest and restoration to the body and psyche [11]. Sushruta Samhita attributes sleep to the natural predominance of Tamo-guṇa and considers it a svabhavika avastha (natural state), necessary for normal functioning of body and mind [12]. Ashtanga Hridaya explains that when Kapha accumulates in the channels and the mind becomes dissociated from sensory objects, Nidra manifests spontaneously [13].

Nidra is placed among Trayopastambha—the three subsidiary pillars of life—together with Ahara and Brahmacharya, indicating its foundational role in sustaining Sharira, Indriya, Satva and Atma [11–13]. Good sleep is said to bestow Sukha (comfort), Pushti (nourishment), Bala (strength), Vṛṣṭi (reproductive health), Jnana (cognition) and Jeevita (longevity), while improper sleep leads to their opposites [11].

Later Ayurvedic authors have elaborated the physiological and spiritual significance of sleep. Shetty and Choudhari emphasised Nidra as a key determinant of healthy lifestyle and noted its importance in preventing lifestyle disorders such as hypertension, obesity, and diabetes [23]. Jain highlighted the role of balanced Nidra in maintaining Kapha–Tamas equilibrium and preventing Anidra (insomnia) and related psychosomatic disorders [26].

2.2 Nidra as Adharaniya Vega and the Concept of Nidra-Vega-Dharana:

Ayurveda classifies natural urges (Vega) into Dharaniya (suppressible) and Adharaniya (non-suppressible). Charaka Samhita lists thirteen Adharaniya Vegas, including urges of urine, faeces, flatus, vomiting, belching, hunger, thirst, tears, exertional breathing—and Nidra (sleep) [11]. Suppression of these non-suppressible urges (Vega-Dharana) is described as a major cause of disease, primarily through Vāta prakopa and disturbance of normal physiology [11,14].Vagbhata further asserts that most diseases arise from Vega-Dharana and inappropriate initiation (Vega-Udiraṇa) of natural urges [13]. Nidra-Vega-Dharana—deliberate or habitual suppression of the sleep urgeis particularly emphasised. Classical texts list characteristic manifestations such as Jrmbha (excess yawning), Angamarda (body ache), Tandra (drowsiness), Moha (confusion), heaviness of head and eyes, and impaired digestion [11–13].Aggarwal et al. underlined that suppression of sleep urge has profound effects on physical, mental, and social health, and they characterised Nidra Vega as a “pivotal component of life”, directly linked with vitality and resilience [27]. Ingle et al. reiterated the centrality of Nidra Vega within Trayopastambha, emphasising that honouring the natural impulse to sleep is indispensable for dosha balance and emotional stability [24].

2.3 Systemic and NCD-Relevant Consequences of Vega-Dharana in Ayurveda:

The broader concept of Vegadharana has been reviewed extensively. Zahra et al. analysed Adharaniya Vega suppression and reported that it can affect cardiovascular, gastrointestinal, respiratory, urinary, and reproductive systems, primarily via Vata vitiation [25]. Meghwal et al. focused specifically on Nidra Vega and concluded that repeated suppression of the sleep urge disrupts homeostasis across multiple systems and may act as an upstream factor for several chronic disorders [17].Ayurvedic authors have drawn links between disturbed Nidra and Prajnaparadha (errors of intellect), Agni-mandya (digestive fire impairment), Srotodushti (microchannel disturbance), and derangement of Tridosha, especially Vāta [11,13,17,25]. These mechanisms conceptually parallel the modern notions of neuroendocrine imbalance, stress biology, metabolic dysregulation, and chronic low-grade inflammation—all of which are recognised precursors for Non-Communicable Diseases.Swami discussed Veg Vidharan in relation to lifestyle disorders and suggested that suppression of certain Adharaniya Vegas—particularly Nidra, Kshudha and Trishna—promotes Apatarpana (undernourishment) followed by maladaptive compensatory behaviours, which ultimately contribute to Sthaulya (obesity) and other lifestyle-related conditions [30].

2.4 Modern Literature on Sleep Deprivation, Circadian Disruption and NCDs:

Modern sleep science confirms many of these classical observations. Walker and colleagues demonstrated that sleep plays a crucial role in learning, memory consolidation, emotional regulation, and synaptic homeostasis [14]. Short sleep duration and poor sleep quality have been associated with obesity, Type 2 diabetes, hypertension, coronary artery disease, stroke, depression and increased all-cause mortality in multiple population-based studies [15,21].

Insufficient sleep is known to activate the hypothalamic–pituitary–adrenal (HPA) axis, raising cortisol levels and sympathetic tone, thereby elevating blood pressure, and promoting central adiposity [18]. Sleep deprivation also alters leptin and ghrelin levels, encouraging hyperphagia and weight gain, and increases inflammatory markers such as IL-6 and TNF-α, promoting insulin resistance and endothelial dysfunction [18,19]. Disturbance of circadian genes (CLOCK, BMAL1, etc.) further disrupts glucose metabolism, lipid handling, blood pressure rhythms, and immune regulation, strengthening the link between chronic sleep loss and NCDs [19].WHO and CDC reports emphasise inadequate sleep as a clinically relevant lifestyle factor that should be addressed in NCD prevention frameworks alongside diet, physical activity, tobacco, and alcohol [15,21].

2.5 Nidra-Vega-Dharana in Night Shift and Lifestyle-Related Studies:

Night-shift work is a practical model of chronic Nidra-Vega-Dharana. Gupta et al. studied night-duty healthcare workers and found a high prevalence of symptoms corresponding to Nidra Vega Dharana, such as fatigue, excessive yawning, heaviness of head, digestive disturbances, and impaired daytime functioning; a considerable proportion showed multiple concurrent symptoms suggestive of significant physiological strain [20].Kumar et al. reviewed physiological changes in night shift workers in relation to Nidra Vega Dharana and documented associations with gastrointestinal complaints, metabolic disturbances, menstrual irregularities, musculoskeletal discomfort, and increased risk of cardiovascular morbidity, mediated partially by circadian misalignment and Vata aggravation [29].

Further, Jain elaborated the clinical picture of Anidra and its role in psychological and somatic disorders, while Aggarwal et al. and Ingle et al. stressed the necessity of considering Nidra Vega Dharana in clinical assessment and health promotion strategies [24,26,27,29].

On the NCD side, Gupta et al. and Bhukan et al. described the role of Ayurveda in NCD prevention, highlighting Dinacharya, Ritucharya, Ahara–Vihara, Trayopastambha and management of Viruddha Ahara and Vega-Dharana as crucial in addressing modifiable risk factors [22,28]. These works implicitly support the idea that disciplined sleep behaviour and avoidance of Nidra-Vega-Dharana are important in NCD risk reduction.

2.6 Identified Gaps in Existing Literature:

Although several studies and reviews discuss Nidra, Vega-Dharana, sleep disorders and night-shift work separately, there remain important gaps:

a. Lack of Integrative Models: No comprehensive framework yet articulates how Nidra-Vega-Dharana specifically, rather than general insomnia, mechanistically contributes to NCD pathogenesis by integrating Ayurvedic concepts (Vata prakopa, Prajnaparadha, Agni-mandya, Srotodushti) with modern mechanisms (HPA-axis activation, circadian gene disruption, inflammatory and metabolic changes) [17,18,19,25,29].
b. Under-recognition as a Behavioural Risk Factor: In modern public health and NCD policy documents, sleep-related issues are

mentioned but suppression of the natural sleep urge as a distinct behavioural pattern is rarely conceptualised or addressed, despite its strong resonance with real-world patterns such as late-night screen use, work demands and shift schedules [15,20,21,28].

c. Limited Quantitative Data from Ayurvedic Perspective: Most Ayurvedic works on Nidra-Vega-Dharana are conceptual or review-based. There is a paucity of robust observational or interventional studies using standardised sleep and NCD risk markers, designed explicitly from an Ayurvedic hypothesis standpoint [17,22,25,29].

These gaps justify the need for the present conceptual article, which aims to synthesise classical doctrine and modern evidence to propose a coherent mechanism-rich model explaining how suppression of the sleep urge (Nidra-Vega-Dharana) directly and indirectly amplifies NCD risk.

3. AIM & OBJECTIVES:

3.1 Aim:

- To critically analyse the Ayurvedic concept of Nidra-Vega-Dharana (suppression of the sleep urge) and evaluate its direct and indirect implications in the development of Non-Communicable Disease (NCD) risk factors through an integrative Ayurveda–biomedical approach.

3.2 Objectives:

- To explore and interpret classical Ayurvedic literature describing Nidra, Adharaniya Vega, and the pathophysiological consequences of Vega-Dharana.
- To synthesise and compare modern biomedical evidence on sleep deprivation, circadian disruption, neuroendocrine imbalance, inflammation, and metabolic disorders associated with NCD risk.
- To develop an integrative conceptual framework correlating Ayurvedic mechanisms with contemporary physiological pathways to explain how Nidra-Vega-Dharana contributes to NCD progression.

4. HYPOTHESIS: It is hypothesised that Nidra-Vega-Dharana (suppression of the sleep urge) acts as a significant behavioural and physiological trigger that accelerates the development of major Non-Communicable Disease (NCD) risk factors. This occurs by initiating interconnected pathways involving Vata aggravation, disturbance of Agni, Srotas dysfunction, chronic HPA-axis activation, circadian misalignment, systemic inflammation, metabolic derangement, and behavioural dysregulation. Therefore, Nidra-Vega-Dharana may be considered an independent, modifiable risk factor contributing to NCD susceptibility.

5. MATERIALS AND METHODS:

5.1 Study Design: This work is designed as a conceptual and narrative review article combining classical Ayurvedic principles with modern biomedical evidence. It aims to develop a comprehensive and integrative understanding of Nidra-Vega-Dharana and its relationship with NCD risk factors.

5.2 MATERIALS AND METHODS:

This review article employs a conceptual and narrative methodology to analyse the Ayurvedic principle of Nidra-Vega-Dharana (suppression of sleep urge) and its potential contribution to Non-Communicable Disease (NCD) risk. The approach integrates classical Ayurvedic knowledge with contemporary biomedical evidence to formulate a unified explanatory framework.

5.3 Sources of Information: The review draws upon three major categories of information:

5.3.1 Classical Ayurvedic Texts: Primary scriptures including Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya, Ashtanga Samgraha, and Kashyapa Samhita were examined for descriptions of Nidra, Adharaniya Vega, Vega-Dharana, and associated pathophysiology. Standard commentaries were used to ensure accurate interpretation of Sanskrit concepts.

5.3.2 Contemporary Ayurvedic Literature: Recent review papers, conceptual articles, and institutional publications discussing Nidra Vega Dharana, lifestyle disorders, sleep-related behavioural patterns, and physiology of shift workers were analysed. These documents provide modern Ayurvedic insights into Nidra, Vata aggravation, and systemic disturbances linked with sleep suppression.

5.3.3 Biomedical Literature: Peer-reviewed journals accessed through PubMed, Google Scholar, and Scopus were reviewed for evidence on sleep physiology, circadian rhythm disruption, HPA-axis activation, inflammation, oxidative stress, metabolic syndrome, and epidemiological NCD trends (CDC, WHO). These sources were used to create correlations with classical mechanism.

5.4 Methodological Approach:

5.4.1 A textual analysis method was applied to classical sources, focusing on conceptual definitions, physiological mechanisms, and disease pathways. Modern findings were processed through

5.4.2 Thematic synthesis, identifying recurring mechanisms such as cortisol elevation, leptin–ghrelin imbalance, insulin resistance, and inflammatory activation.

5.4.3 An integrative analytical framework was then developed by correlating Ayurvedic constructs (Vāta-prakopa, Agni-mandya, Srotodushti, Prajñāparādha) with biomedical mechanisms (autonomic imbalance, endocrine dysregulation, cytokine activation). Findings were arranged into a coherent narrative to illustrate how Nidra-Vega-Dharana may influence NCD risk.

6. OBSERVATIONS

The integrative review of classical Ayurvedic literature, contemporary Ayurvedic articles, and modern biomedical evidence reveals clear and consistent patterns indicating that Nidra-Vega-Dharana (suppression of the sleep urge) produces wide-ranging physiological, psychological, and metabolic disturbances. These disturbances exhibit strong parallels with clinically recognised Non-Communicable Disease (NCD) risk factors.

6.1 Patterns of Nidra-Vega-Dharana Identified in Literature

6.1.1 Early Symptoms (Ayurvedic Findings)

Classical Ayurvedic texts consistently identify a cluster of early manifestations arising from suppression of the natural sleep urge. These include:

- Jrambha (excess yawning)
- Angamarda (body ache)
- Tandra (persistent drowsiness)
- Manda-jnana (slowness of intellect)
- Heaviness in head and eyes
- Irritability, fatigue, and decreased motivation
- Digestive impairment (Agni-mandya)
- Decreased physical and mental tolerance (dhairya-bala bhramsha)

These symptoms reflect an early stage of Vata aggravation, reduced mental clarity, and systemic imbalance.

Table 1. Ayurvedic Description of Nidra-Vega-Dharana and Its Early Manifestations

Ayurvedic Concept	Description from Classical Texts	Physiological Interpretation
Nidra (Sleep)	One of the Trayopastambha; essential for Sharira, Manas, Indriya stability	Restorative physiological state; neuro-endocrine regulation
Adharaniya Vega	Sleep urge is non-suppressible (Charaka)	Suppression leads to autonomic and metabolic disturbance
Nidra-Vega-Dharana	Forcible withholding of sleep	Chronic sleep deprivation; circadian disruption
Early Symptoms	Jrmbhā, Angamarda, Tandra, Bhrama, Manda-Jñana	Fatigue, brain fog, muscle tiredness, reduced cognition
Dosha Involvement	Vāta prakopa predominant	Autonomic imbalance, stress activation

6.1.2 Progressive Manifestations (Observed in Contemporary Studies)

Review of shift-work studies and sleep-behaviour surveys reveals progressively worsening symptoms commonly reported by individuals with chronic sleep suppression:

- Persistent fatigue, reduced alertness
- Gastrointestinal symptoms: constipation, indigestion, bloating
- Hormonal disturbances: menstrual irregularities, reduced libido
- Cognitive impairment: forgetfulness, reduced attention span
- Mood alterations: anxiety, irritability, depression
- Increased cravings for high-calorie foods
- Reduced physical activity and motivation

These align with modern biomedical markers of sleep debt and circadian disruption.

Table 2. Modern Physiological Effects of Sleep-Urge Suppression

System/ Domain	Observed Biological Changes	Implications for NCD Development
Endocrine	↑ Cortisol, ↑ Ghrelin, ↓ Leptin	Obesity, insulin resistance
Metabolic	Impaired glucose uptake, ↓ insulin sensitivity	Type 2 diabetes, metabolic syndrome
Cardio-vascular	↑ Blood pressure, ↑ heart rate, endothelial dysfunction	Hypertension, atherosclerosis
Inflammatory	↑ IL-6, ↑ TNF-α, ↑ CRP	Chronic inflammation, CVD risk
Neuro-cognitive	Mood swings, irritability, impaired memory	Depression, anxiety
Circadian	Disruption of CLOCK/BMAL1	Hormonal desynchronization

6.2 Correlation with NCD Risk Factors:

Table 3. Correlation Between Ayurveda and Modern Pathophysiology

Ayurvedic Mechanism	Modern Equivalent	Resulting Pathology
Vāta Prakopa	Sympathetic overactivation	Hypertension, anxiety
Agni Mandya	Metabolic downregulation	Obesity, dyslipidemia
Srotodushti	Microvascular dysfunction	CVD, inflammation
Ojas Kshaya	Immune suppression	Higher disease vulnerability
Prajñāparādha	Behavioural dysregulation	Poor sleep hygiene, overeating

6.2.1 Metabolic Disturbances:

Across biomedical studies, chronic sleep suppression is associated with:

- Insulin resistance and impaired glucose tolerance
- Increase in ghrelin and decrease in leptin levels → overeating
- Weight gain, central obesity
- Dyslipidemia (↑ LDL, ↓ HDL)
- Early signs of metabolic syndrome

Ayurvedically, these manifest as Agni-mandya, Medo-dushti, and Kapha-vriddhi.

6.2.2 Cardiovascular Risk Markers:

Multiple studies document that insufficient sleep increases:

- Sympathetic nervous system activation
- Blood pressure variability
- Resting heart rate
- Risk of hypertension and endothelial dysfunction

This correlates with Vāta-prakopa and Rakta-vaha srotodushti described in Ayurveda.

6.2.3 Inflammatory & Oxidative Stress Markers:

Chronic Nidra-Vega-Dharana correlates with elevated:

- IL-6
- TNF-α
- C-reactive protein (CRP)
- Free radicals and oxidative stress markers

These biomarkers are foundational contributors to diabetes, atherosclerosis, and cardiovascular disease.Ayurvedic parallel: Ama formation, Srotorodha, Utklesha of Doshas.

6.2.4 Neuroendocrine Disturbances:

Suppression of sleep urge leads to:

- HPA-axis hyperactivation
- Elevated cortisol
- Reduced melatonin
- Circadian gene disruption (CLOCK, BMAL1)
- Autonomic imbalance

This results in fatigue, depression, reduced immunity, and metabolic dysfunction.

Ayurvedically, this aligns with Manovaha srotodushti, Prāṇavaha disturbances, and Prajñāparādha.

6.2.5 Lifestyle Behavioural Shifts:

Across studies, chronic sleep urge suppression is linked to:

- Emotional eating
- Less physical activity
- Increased caffeine/nicotine use
- Poor dietary choices
- Social withdrawal
- Reduced motivation

These lifestyle patterns significantly increase NCD susceptibility.

6.3 Summary of Observations:

Across all three knowledge sources—classical Ayurveda, contemporary Ayurvedic reviews, and modern biomedical studies—there is a consistent, reproducible pattern: Nidra-Vega-Dharana produces multidimensional disruption that directly overlaps with major NCD physiological pathways.

The results strongly support the hypothesis that sleep-urge suppression is an independent modifiable risk factor that accelerates metabolic, cardiovascular, neuroendocrine, inflammatory, and behavioural changes associated with NCDs.

Table 4. Nidra-Vega-Dharana and NCD Risk: Integrated Summary

Risk Factor Category	Ayurvedic Explanation	Modern Mechanism
Metabolic	Medo-dushti, Agni-mandya	Insulin resistance, fat accumulation
Cardiovascular	Rakta-vaha srotodushti, Vāta vriddhi	BP elevation, endothelial stress
Psychological	Manovaha srotodushti, Tamo vriddhi	Depression, anxiety, mood irregularities
Digestive	Mandagni, Aamotpatti	GERD, constipation, dysbiosis
Behavioural	Prajñāparādha	Addiction, emotional eating

7. DISCUSSION

The findings of this review highlight a compelling convergence between classicalAyurvedic understanding of Nidra-Vega-Dharana and modern biomedical evidence related to sleep deprivation, circadian disruption, metabolic imbalance, and increased Non-Communicable Disease (NCD) risk. Ayurveda identifies sleep as a foundational physiological pillar, while modern sleep science recognizes it as essential for metabolic, neuroendocrine, emotional, and immunological homeostasis. Suppression of the natural urge for sleep, therefore, disrupts a broad spectrum of bodily functions, activating multiple disease pathways. This discussion synthesises classical concepts with modern mechanisms to explain how Nidra-Vega-Dharana directly and indirectly contributes to NCD development.

7.1 Nidra-Vega-Dharana and Vata Prakopa: An Ayurvedic Starting Point

Ayurvedic texts identify Vata-dosha as the first and primary dosha to be disturbed during suppression of the sleep urge. Vata governs all neurological, sensory, respiratory, circulatory, and behavioural functions. When sleep is forcibly delayed or resisted, classical symptoms such as jrmbha (yawning), tandra (drowsiness), angamarda (body ache), bhrama (light-headedness), and cognitive dullness emerge, indicating early Vata prakopa.

The progression of Vata-vikriti due to Nidra-Vega-Dharana manifests as: Restlessness and anxiety, Autonomic instability, Irregular digestive patterns., Disturbed circulation, Impaired sensory-motor coordination, In chronic cases, Vata derangement leads to dhatu-kshaya (tissue depletion), ojas diminution, and psychosomatic instability—conditions strongly associated with modern chronic illness.

7.2 Prajnaparadha (Errors of Intellect) as the Root Cause:

In Ayurveda, Nidra-Vega-Dharana is categorised under Prajnaparadha—actions performed knowingly against natural wisdom. Habitual late-night screen exposure, extended work hours, overstimulation, and lifestyle choices that delay sleep fit this definition accurately. Prajnaparadha triggers: Dysregulation of natural biorhythms, Disengagement from physiological cues, Persistent sympathetic arousal, Poor judgement and repetitive unhealthy behaviours, modern psychology similarly identifies chronic sleep restriction as a cause of impulsive eating, emotional dysregulation, reduced motivation, substance use (caffeine/nicotine), and impaired decision-making—all compounding NCD risk.

7.3 Roga Marga Involvement: Impact on Srotas (Channels of the Body):

Ayurveda explains disease progression through roga-marga—the

pathway of pathological spread across bodily channels (srotas). Nidra-Vega-Dharana affects several systems:

7.3.1 Manovaha Srotas (Psychological Channels):

Anxiety, irritability, mood swings, reduced concentration and memory, higher susceptibility to depression, these correlate with modern findings on sleep deprivation affecting emotional processing, limbic system reactivity, and cognitive performance.

7.3.2 Annavaha and Rasavaha Srotas (Digestive & Nutritional Channels):

Weak digestive fire (Agni-mandya), improper metabolism, malabsorption and ama formation, modern parallels include altered glucose regulation, disrupted appetite hormones (leptin ↓, ghrelin ↑), and metabolic slowdown.

7.3.3 Praṇavaha and Raktavaha Srotas (Cardio-respiratory Channels):

Elevated pulse and blood pressure, vascular stiffness, reduced tissue oxygenation, these align with sympathetic overactivation, endothelial dysfunction, and hypertension observed in sleep-deprived individuals.

7.4 Neuroendocrine Mechanisms: The Modern Bridge

7.4.1 HPA-Axis Hyperactivation:

When sleep urge is suppressed, the hypothalamic-pituitary-adrenal (HPA) axis becomes hyperactive, increasing:Cortisol, adrenaline, noradrenaline, these hormonal changes elevate blood pressure, increase glucose levels, and impair insulin sensitivity. Chronic cortisol exposure promotes visceral adiposity and accelerates metabolic syndrome.

7.4.2 Circadian Rhythm Disruption:

Suppression of sleep disrupts endogenous circadian clocks regulated by CLOCK, BMAL1, and PER genes. Consequences include:Altered melatonin secretion, delayed, or misaligned sleep phases, impaired thermoregulation, hormonal desynchronisation, Ayurvedically, this signifies provocation of Vata and disturbance of daily routines (dinacharya-viplava).

7.4.3 Sleep Deprivation and Metabolic Syndrome: A Direct Link:

Modern research confirms a strong association between chronic sleep suppression and metabolic syndrome components:Impaired insulin signalling, increased fat storage, especially visceral, dyslipidaemia, increased appetite and late-night snacking, reduced energy expenditureAyurvedic equivalent: Medovaha srotodushti, kapha-vriddhi, and agni-mandya.

7.4.4 Stress Pathways and Psychophysiological Impact:

Nidra-Vega-Dharana increases sympathetic nervous system dominance. This triggers:Tachycardia, anxiety, gastrointestinal dysfunction, reduced immune function, heightened inflammation, Ayurveda mirrors this as udvega, udavarta, pachana-mandya, and ojas-kshaya.

7.4.5 Inflammation & Oxidative Stress: Indirect NCD Amplifiers:

Sleep suppression significantly elevates inflammatory markers:IL-6, TNF-α, CRP, Free radicals, Chronic inflammation is a known driver of:Atherosclerosis, Diabetes, Obesity, Neurodegeneration. Ayurveda describes a similar process through ama, srotorodha, and dhatu-daurbalya.

7.4.6 Step-wise Explanation of NCD Risk Amplification:

Step 1: Sleep Urge Suppression

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Immediate Vata aggravation, psychological unrest

Step 2: Neuroendocrine Activation

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Cortisol rise → Autonomic imbalance → Metabolic strain

Step 3: Circadian Rhythm Breakdown

↓

Hormonal dysregulation, impaired glucose metabolism

Step 4: Inflammation & Oxidative Stress

↓

Silent but chronic systemic damage

Step 5: Behavioural Compensations

↓

Overeating, cravings, sedentary habits, addiction tendencies

Step 6: NCD Development and Progression

Metabolic syndrome → Hypertension → cardiovascular disease → Diabetes → Obesity → Mental health disorders

This aligns with Ayurvedic samprapti (pathogenesis) involving dosha prakopa, dushya vikriti, and srotas dushti.

8. Clinical Significance:

Understanding the implications of Nidra-Vega-Dharana carries considerable clinical and public health significance, particularly in the context of rapidly rising Non-Communicable Diseases (NCDs). Suppression of the natural sleep urge is increasingly common due to modern lifestyle pressures, technology overuse, shift work, and psychosocial stress. Recognising this behaviour as a distinct and modifiable risk factor is essential for early prevention.From an Ayurvedic standpoint, Nidra is one of the Trayopastambha, fundamental pillars of life. Its disruption leads to Vāta prakopa, Agni-mandya, Srotodushti, and Ojas-kshaya—pathological states that parallel the biomedical mechanisms involved in metabolic disorders, hypertension, obesity, and mental health disturbances. Clinically, identifying early signs of Nidra-Vega-Dharana (fatigue, drowsiness, irritability, altered appetite, digestive impairment) offers a valuable opportunity for timely intervention.In modern primary care settings, inadequate sleep is closely associated with insulin resistance, sympathetic overactivation, inflammatory markers, weight gain, mood disorders, and cardiovascular strain. Therefore, incorporating questions about sleep-urge suppression into routine assessments can enhance NCD risk screening.

Ayurveda-based lifestyle protocols such as Dinacharya, regulated sleep timings, management of screen exposure, relaxation practices, Vata-pacifying diet, Abhyanga, and evening rituals (Ratricharya) offer effective, low-cost preventive strategies. Education on honouring natural urges (Adharaniya Vega) can also be integrated into community health programs.

Overall, acknowledging Nidra-Vega-Dharana as a behavioural determinant strengthens preventive healthcare frameworks and supports holistic, integrative approaches to NCD reduction.

9. CONCLUSION

This review highlights that Nidra-Vega-Dharana—the suppression of the natural urge to sleepis a significant yet often overlooked behavioural factor contributing to the rising burden of Non-Communicable Diseases (NCDs). Classical Ayurvedic texts describe Nidra as a foundational pillar of health, essential for maintaining physiological balance, mental clarity, digestive strength, and immunity. Suppression of this vital function initiates Vata prakopa, Agni-mandya, and Srotodushti, which reflect systemic instability and serve as early markers of disease progression.

Modern biomedical research aligns closely with these principles, demonstrating that sleep deprivation and circadian disruption activate the HPA axis, increase cortisol levels, impair glucose and lipid metabolism, elevate inflammatory mediators, and induce oxidative stress. These mechanisms are central to the pathogenesis of metabolic syndrome, type 2 diabetes, cardiovascular disease, obesity, and mental health disorders. Behavioural consequences such as overeating, reduced physical activity, and emotional dysregulation further compound these risks.

Integrating the Ayurvedic concept of Vega-Dharana with contemporary sleep science provides a more comprehensive understanding of NCD aetiology. The findings underscore the importance of recognising Nidra-Vega-Dharana as an independent, modifiable risk factor that should be incorporated into lifestyle counselling, preventive healthcare, and NCD screening strategies. Encouraging respect for natural urges, promoting healthy sleep hygiene, and implementing Ayurveda-based lifestyle interventions can substantially support public health efforts in reducing NCD burden.

10. LIMITATIONS

This review is conceptual in nature and relies primarily on secondary literature derived from classical Ayurvedic texts, contemporary conceptual papers, and modern biomedical research. As no primary clinical data or experimental studies were generated, the conclusions are limited by the quality and variability of the available literature. Several Ayurvedic sources lack quantitative metrics, while some modern studies do not specifically distinguish sleep-urge suppression from general sleep deprivation. Additionally, heterogeneity in study designs, sample characteristics, and outcome measures restricts the ability to derive definitive causal relationships. Future research should include well-designed clinical and observational studies explicitly examining Nidra-Vega-Dharana and its long-term impact on NCD risk profiles.

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