

Review Article

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## CHRONOBIOLOGY AND *DINCHARYA*: ALIGNING BIOLOGICAL RHYTHMS WITH AYURVEDIC LIFESTYLE

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### ABSTRACT

**Background:** *Dincharya*, the concept of daily regimen in *Ayurveda*, aims to maintain health by aligning human activities with nature's cyclical rhythms. *Chronobiology*, a modern scientific discipline, studies biological rhythms such as circadian cycles that govern physiological functions. Integrating these two systems offers a holistic approach to health promotion and disease prevention.

**Aim and Objectives:** To critically analyze the principles of *Dincharya* in relation to chronobiological rhythms and evaluate their potential synergistic role in promoting optimal health and preventing lifestyle-related disorders. **Materials and Methods:** This conceptual review was conducted by collecting references from classical *Ayurvedic* texts like *Ashtanga Hridaya*, *Charaka Samhita*, and *Sushruta Samhita*, along with peer-reviewed modern research articles on chronobiology. Comparative analysis was done to map *Dincharya* practices with circadian-regulated biological processes. **Observations and Results:** Activities prescribed in *Dincharya* such as *Brahmamuhurta Jagarana*, *Abhyanga*, *Vyayama*, and meal timings demonstrate remarkable parallels with modern circadian principles. Scientific studies support that early rising, regular physical activity, and timely eating contribute to hormonal balance, metabolic health, and improved mental wellbeing—outcomes that align with *Ayurvedic* objectives. **Conclusion:** The convergence of *Dincharya* and chronobiology provides a scientifically rational foundation for synchronized lifestyle practices. This alignment fosters homeostasis and strengthens preventive healthcare, suggesting that traditional *Ayurvedic* regimens have timeless applicability in modern health paradigms.

**Keywords:** *Dincharya*, *Ayurveda*, Chronobiology, Circadian Rhythm, Preventive Health, Biological Clock

## Introduction

Ayurveda, the ancient science of life, emphasizes the importance of living in harmony with nature's rhythms. The classical concept of *Dincharya*—a meticulously structured daily regimen—aims to maintain *doshic* balance and prevent disease by regulating daily activities such as waking, bathing, eating, exercising, and sleeping. These activities are strategically recommended according to the body's natural physiological tendencies, influenced by the movement of the sun and changes in the environment. Acharyas like *Charaka* and *Vagbhata* stressed that following *Dincharya* is essential for *swasthya rakshana* (maintenance of health) and *roga prashamana* (suppression of disease).<sup>1</sup>

The foundational belief in *Ayurveda* is that time (*kala*) plays a pivotal role in health and disease. This time element is seen not only in seasonal variations (*Ritucharya*) but also in diurnal rhythms (*Dincharya*). The *tridosha* theory—*Vata*, *Pitta*, and *Kapha*—operates in cyclic patterns throughout the day.<sup>2</sup> For instance, the early morning period is *Kapha*-dominant, the midday is *Pitta*-dominant, and the evening is influenced by *Vata*. This cyclical dominance is mirrored in the scheduling of bodily functions, which *Ayurveda* prescribes to align with natural energies for optimal health and performance.<sup>3</sup>

Practices like *Brahmamuhurta jagarana*, *Ushapana*, *Abhyanga*, *Vyayama*, and *Ahara vidhi* are structured to optimize physical and mental health by working in synchrony with natural biological rhythms.<sup>4</sup> These practices enhance *agni* (digestive fire), promote mental clarity (*sattva*), and balance bodily systems. Their significance becomes even more relevant in the modern era, where lifestyle-related disorders are rampant due to disturbed biological routines and irregular daily habits.<sup>5</sup>

Epidemiological data indicate a rising trend in lifestyle disorders such as insomnia, obesity, metabolic syndrome, hypertension, and depression. A significant contributing factor is the disruption of natural biological rhythms due to erratic work schedules, excessive screen exposure, shift duties, and sleep deprivation.<sup>6</sup> According to the World Health Organization, non-communicable diseases account for over 70% of global deaths, and poor lifestyle patterns are a modifiable risk factor. Reestablishing harmony with the body's biological clock has become a pressing need in preventive medicine.<sup>7</sup>

Modern science, through the field of chronobiology, has validated the existence of internal biological clocks—circadian rhythms—that regulate sleep-wake cycles, hormone secretion, digestion, and body temperature.<sup>8</sup> The suprachiasmatic nucleus (SCN) in the hypothalamus acts as a master clock, influenced by light and environmental cues. Disruption in circadian

alignment has been linked with cardiovascular diseases, endocrine disorders, and cognitive decline. The synchronization offered by *Dincharya* mirrors chronobiological principles, making it a timeless tool for maintaining health through behavioral alignment with natural time cycles.<sup>9</sup>

## AIM AND OBJECTIVES

### Aim

To correlate *Dincharya* principles of *Ayurveda* with modern chronobiology and evaluate their role in lifestyle regulation and health promotion.

### Objectives

1. To review classical *Ayurvedic* concept of *Dincharya*.
2. To understand modern chronobiological principles.
3. To compare *Dincharya* with circadian rhythms.
4. To assess the role of *Dincharya* in preventing lifestyle disorders.
5. To propose an integrative approach for health optimization.

## MATERIALS AND METHODS

This study is a conceptual review based on classical *Ayurvedic* literature and modern scientific research. References were obtained from authoritative *Ayurvedic* texts including *Charaka Samhitā*, *Sushruta Samhitā*, and *Ashtāṅga Hṛdaya*, with special emphasis on the chapters describing *Dincharya*. Commentaries such as *Ayurveda Deepika*, *Nibandha Saṅgraha*, and *Sarvāṅgasundarā ṭīkā* were also consulted for interpretative depth.<sup>10</sup>

Modern scientific data on chronobiology, circadian rhythms, and biological clocks were gathered through a comprehensive literature search using databases like PubMed, Scopus, and Google Scholar. Key search terms included: *chronobiology*, *circadian rhythm*, *biological clock*, *Dincharya*, *Ayurveda*, and *lifestyle disorders*.<sup>11</sup>

## CONCEPT OF DINCHARYA

*Dincharya*, derived from “*Dina*” meaning *day* and “*Charya*” meaning *regimen or routine*, is a classical *Ayurvedic* concept that refers to the ideal daily schedule every individual should follow to maintain health (*swasthya*) and prevent disease (*rogapratibandhaka*). This systematized approach, as elaborated by *Acharya Charaka*, *Sushruta*, and *Vagbhata*, is designed to synchronize the body’s internal biological processes with the natural diurnal variations governed by *dosha*, time (*kala*), and environmental factors.<sup>12</sup>

According to *Ayurveda*, the 24-hour day is cyclically governed by the predominance of the *tridoshas*—*Vata*, *Pitta*, and *Kapha*. These *doshas* naturally fluctuate in specific time frames:

- **Kapha kala:** 6:00 AM – 10:00 AM and 6:00 PM – 10:00 PM
- **Pitta kala:** 10:00 AM – 2:00 PM and 10:00 PM – 2:00 AM
- **Vata kala:** 2:00 PM – 6:00 PM and 2:00 AM – 6:00 AM

The activities prescribed in *Dincharya* are intended to work in harmony with these *dosha* fluctuations. The day begins with waking in *Brahmamuhurta* (approximately 4:00–5:30 AM), which is ideal for *Vata*-dominant mental clarity and spiritual practices like meditation and study. Elimination of natural urges (*vegotsarga*), oral hygiene (*dantadhavan*, *gandusha*, *nasya*), body massage (*abhyanga*), exercise (*vyayama*), bath (*snana*), and consumption of food (*ahara sevana*) at appropriate times are systematically advised to maintain physical and psychological health.<sup>13</sup>

Each of these practices has a physiological rationale:

- **Abhyanga (oil massage)** nourishes *twak*, improves circulation, balances *Vata*, and delays ageing.
- **Vyayama** enhances *agni*, tones muscles, and improves metabolism and immunity.
- **Ahara sevana** during *Pitta kala* (10 AM–2 PM) aligns with peak digestive power (*Jatharagni*).
- **Ratri charya** includes light, timely dinner, winding down, and sleeping before *Kapha kala* ends (before 10 PM), which aids restorative sleep and hormonal regulation.

*Dincharya* is not only a physical discipline but also a **psycho-social and spiritual practice** that instills discipline, harmony, and mindfulness in one's daily life. It is preventive (*Nidana Parivarjana*), promotive (*Swasthasya Swasthya Rakshanam*), and therapeutic, forming the basis of *Ayurvedic* lifestyle intervention in managing chronic and lifestyle-related disorders.<sup>14</sup>

In the modern context, where disordered routines, stress, late-night activities, and irregular eating patterns disrupt circadian rhythms and contribute to diseases like obesity, diabetes, hypertension, depression, and insomnia, *Dincharya* offers a time-tested and science-backed framework for lifestyle regulation.<sup>15</sup>

Thus, *Dincharya* stands as a timeless and dynamic approach to health that reflects *Ayurveda*'s core philosophy—living in tune with nature's rhythm to attain balance in body, mind, and soul.

**TABLE NO. 1 DINCHARYA**

<b>Activity</b>	<b>Timing</b>	<b>Purpose</b>
<i>Brahmamuhurta Jagarana</i>	~4–5:30 AM	Mental clarity, elimination
<i>Vega Utsarga</i>	Immediately after waking	Detoxification
<i>Danta Dhavana &amp; Jihva Nirlekhan</i>	Early morning	Oral hygiene, digestion
<i>Nasya, Anjana, Gandusha</i>	Post-hygiene	Sense organ care
<i>Abhyanga</i>	Before bath	Vata balancing, skin health
<i>Vyayama</i>	Morning	Strength, metabolism
<i>Snana</i>	Post-exercise	Refreshment
<i>Ahara Sevana</i>	10 AM–12 PM & before 8 PM	Digestion & nourishment
<i>Ratricharya &amp; Nidra</i>	Evening–Night	Relaxation, rejuvenation

### 1. Brahmamuhurta Jāgaraṇa (Waking up during Brahmamuhurta)

- **Timing:** ~1.5 hours before sunrise (approx. 4:00–5:30 AM)
- **Significance:** Ideal for *Vata* balancing; promotes mental clarity, peace, spiritual growth, and proper elimination.

### 2. Mala-Mutra Vega Utsarga (Evacuation of Urine and Stool)

- Encouraged immediately after waking to cleanse the body of overnight waste.
- Delaying this can lead to *Vata vitiation*, bloating, constipation, and other diseases.
- Ensures proper functioning of *Apana Vayu*.

### 3. Danta Dhavana (Cleaning of Teeth)

- Performed using *kashaya rasa* (astringent), *tikta* (bitter), and *katu* (pungent) herbs like *neem*, *khadira*, or *arjuna* twigs.
- Benefits: Removes bad breath, strengthens gums, prevents dental diseases.

### 4. Jihva Nirlekhan (Tongue Scraping)

- Removes *ama* (toxins) and dirt accumulated on the tongue.

- Stimulates digestive enzymes and improves taste perception.
- Tools: Gold, silver, copper, or stainless-steel scrapers.

#### **5. Achamana (Rinsing Mouth)**

- Involves sipping water and rinsing the mouth to promote cleanliness and refresh the mind.

#### **6. Anjana (Collyrium Application)**

- Uses herbal collyrium (especially *Sauviranjana*) for eye cleansing and vision enhancement.
- Recommended especially for those in dusty or smoky environments.

#### **7. Nasya (Nasal Medication)**

- Administration of medicated oils (e.g., *Anu Taila*, *Shadbindu Taila*) into the nostrils.
- Best done after *abhyanga* and bath.
- Clears nasal passages, enhances sense organs, strengthens voice and memory.

#### **8. Gandusha/Kavala (Oil Pulling/Gargling)**

- Involves holding or swishing medicated oil/decoction in the mouth.
- Strengthens teeth, gums, voice; prevents oral diseases and dryness.

#### **9. Dhumapana (Medicated Smoke Inhalation)**

- Inhalation of medicated smoke via nose and mouth after *nasya* and *kavala*.
- Clears the head, sinuses, and throat; beneficial in *Kapha* disorders, especially for singers or speakers.

#### **10. Abhyanga (Oil Massage)**

- Daily application of warm *Taila* (sesame, bala, or medicated oils) over the body, especially scalp, ears, and feet.
- Balances *Vata*, improves circulation, strengthens skin and muscles, delays aging.

#### **11. Vyayama (Exercise)**

- Exercise until mild sweating occurs (*Ardha Shakti*—half of strength).
- Improves metabolism, body tone, stamina, and enhances *Agni*.
- Over-exertion can vitiate *Vata* and cause fatigue.

#### **12. Snana (Bathing)**

- Taken after *vyayama* to remove sweat and fatigue.
- Refreshes body and mind, enhances complexion, promotes circulation.
- Avoid immediately after meals.

### 13. Vastra Dharana (Wearing Clean Clothes)

- Clean, comfortable, season-appropriate clothes promote hygiene, mental peace, and confidence.

### 14. Bhakshya Kala (Meal Timings and Eating Etiquette)

- **First meal** (lunch) ideally between **10 AM – 12 PM**, when *Pitta* and *Jatharagni* are strongest.
- Warm, freshly prepared, wholesome food should be taken.
- Mindful eating, avoiding talking, and eating as per one's *Agni* is emphasized.

### 15. Karma or Professional Duties (Rajakarya, Swadhyaya)

- The mid-day and afternoon are ideal for performing daily professional, familial, or spiritual duties.
- Maintains social and occupational balance.

### 16. Sandhyopasana / Dhyanam (Evening Meditation or Prayer)

- Practiced at dusk (*Sandhyakala*) to mentally transition from day to night.
- Balances *Manas*, sharpens intellect, and instills *Sattva*.

### 17. Ratrihोजना (Dinner)

- Light, warm, easily digestible food should be taken **before 8 PM**.
- Overeating, cold food, and late meals should be avoided to prevent *Agnimandya* and *Kapha* disorders.

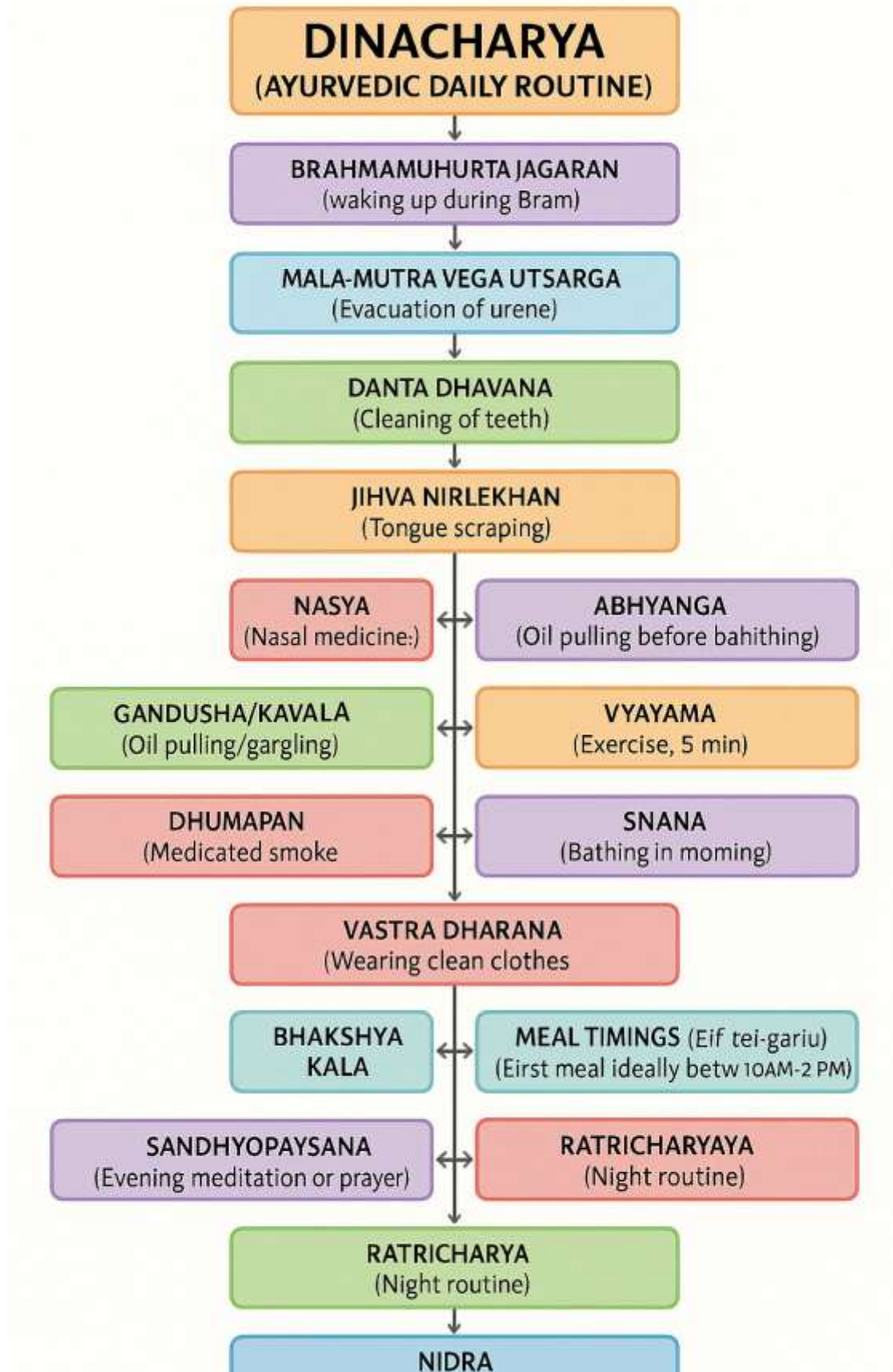
### 18. Ratricharya (Night Routine)

- Light walks after meals aid digestion.
- Avoid excessive screen time or stimulation at night.
- Induces calmness and prepares the body for rest.

### 19. Nidra (Sleep)

- Sleep by **10 PM**, during *Kapha kala*, promotes deep, restorative sleep.
- Enhances memory, energy, immune strength, and emotional stability.

### FLOW CHART OF DINACHARYA





## ROLE OF DINACHARYA IN BIOLOGICAL RHYTHMS

### 1. Understanding Biological Rhythms (Chronobiology)

Biological rhythms, particularly circadian rhythms, are internal processes that follow a roughly 24-hour cycle and regulate essential physiological functions such as:

- Sleep-wake cycles
- Hormone secretion (e.g., cortisol, melatonin)
- Digestion and metabolism
- Body temperature
- Immune function

These rhythms are governed by a biological clock, primarily located in the suprachiasmatic nucleus (SCN) of the hypothalamus, and are influenced by environmental cues like light, food, and activity.<sup>16</sup>

### 2. Ayurvedic Perspective: Time-Structured Living

*Ayurveda* emphasizes *Kala (time)* as a key determinant in health. *Dincharya* (daily regimen) is an expression of *Ayurveda's* awareness of biological time and includes specific practices aligned with *dosha* cycles:

- **Kapha Kala** (6–10 AM/PM): Heavy, slow – ideal for cleansing, bathing
- **Pitta Kala** (10–2 AM/PM): Sharp, hot – best time for digestion, main meals
- **Vata Kala** (2–6 AM/PM): Light, mobile – ideal for creativity, meditation

By following *Dincharya*, an individual naturally aligns with these rhythms and supports the balance of *doshas*, which is central to *Ayurvedic* health philosophy.<sup>17</sup>

### 3. Correlation of Dincharya with Biological Rhythms

Ayurvedic Activity	Chronobiological Parallel	Health Outcome
<i>Brahmamuhurta jagarana</i> (waking ~4–5:30 AM)	Cortisol peak, melatonin decline	Enhances alertness, mental clarity
<i>Ahara Sevana</i> (main meal in Pitta Kala)	Digestive enzyme peak (midday)	Optimal digestion and metabolism
<i>Vyayama</i> (morning exercise)	Morning adrenaline surge	Improved energy, hormonal regulation
<i>Ratricharya</i> (sleep before 10 PM)	Onset of melatonin, Kapha dominance	Deep sleep, tissue repair, immunity

#### 4. Health Implications

Disruption of biological rhythms leads to *dosha* imbalance and is linked with:

- **Lifestyle disorders:** obesity, diabetes, hypertension
- **Sleep disturbances:** insomnia, anxiety
- **Digestive issues:** IBS, loss of appetite
- **Mental health issues:** depression, cognitive decline

*Ayurvedic Dincharya* acts as a behavioral synchronizer, supporting biological homeostasis and disease prevention by reinforcing regularity in sleep, meals, work, and rest.<sup>18</sup>

#### RESULTS AND FINDINGS

1. *Dincharya* aligns with circadian rhythms and supports biological balance.
2. Early waking (*Brahmamuhurta*) improves mental clarity and elimination.
3. Timely meals enhance digestion and metabolism.
4. Morning exercise boosts energy and hormonal health.
5. Practices like *Abhyanga* and *Nasya* regulate sensory and nervous systems.
6. Early sleep supports melatonin release and tissue repair.
7. Irregular routines increase risk of lifestyle diseases.
8. *Dincharya* offers a preventive model validated by chronobiology.
9. Scientific evidence supports *Ayurvedic* time-bound lifestyle.
10. Ancient wisdom and modern science converge through daily regimen.

#### DISCUSSION

The concept of *Dincharya*, as described in classical *Ayurvedic* texts, is a comprehensive framework for maintaining health and preventing disease through time-bound daily activities. These activities are tailored to balance the *tridoshas* and optimize physiological functions according to natural changes in the environment. Waking up during *Brahmamuhurta*, cleansing the body, engaging in *vyayama* (exercise), and consuming meals during *Pitta kala* are practices rooted in ancient wisdom that align with biological processes crucial for health and vitality.<sup>19</sup>

Modern science through chronobiology has discovered the existence of internal biological clocks, especially circadian rhythms, which regulate critical processes such as sleep-wake cycles, digestion, and hormonal secretions. The suprachiasmatic nucleus (SCN) in the hypothalamus is influenced by external cues like light and food, and governs peripheral clocks throughout the body. Disruption in these rhythms is strongly linked with a range of lifestyle disorders including obesity, diabetes, cardiovascular diseases, and psychological disturbances like insomnia and depression.<sup>20</sup>

A comparative analysis between *Dincharya* and chronobiological findings reveals significant parallels. For instance, the timing of *Ahara* (food intake) during midday coincides with peak enzymatic activity and metabolic efficiency. *Abhyanga* and *Nasya* not only serve to pacify *Vata dosha* but also stimulate sensory and neural circuits, maintaining balance and enhancing immunity. Moreover, sleeping before *Kapha kala* ends (i.e., before 10 PM) is in sync with melatonin secretion, allowing proper rest and repair of body tissues, which is now a proven principle in chronobiology.<sup>21</sup>

In light of these findings, *Dincharya* emerges as a well-established lifestyle intervention model that harmonizes with the body's intrinsic biological rhythms. Its relevance in today's fast-paced, irregular lifestyle is more crucial than ever. The convergence of *Ayurvedic* daily regimens and chronobiological principles offers an integrative approach to personalized, preventive, and promotive healthcare. Encouraging individuals to adopt *Dincharya* not only preserves health but also addresses the root cause of many modern ailments by re-establishing internal and external harmony.<sup>22</sup>

## CONCLUSION

The concept of *Dincharya* in *Ayurveda* is a timeless, preventive lifestyle model that intricately aligns with the body's natural biological rhythms. Modern chronobiology validates the ancient practice of time-bound daily routines by demonstrating the critical role of circadian cycles in regulating physiological functions. The synchrony between *Dincharya* and biological rhythms offers a scientifically supported framework for enhancing physical, mental, and emotional well-being. In the context of rising lifestyle disorders, integrating *Ayurvedic* daily regimens into modern living holds significant potential for promoting health, preventing disease, and fostering holistic balance.

## CONFLICT OF INTEREST –NIL

## SOURCE OF SUPPORT – NONE

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