

# Music therapy for sleep disorders based on the Biorhythm theory of *Ayurveda*

Riyana Sreedharan<sup>1</sup>, Karuna Nagarajan<sup>2</sup>, Lakshmi Surendran<sup>3</sup>

<sup>1,2,3</sup> Department of Yoga and Humanities, Swami Vivekananda Yoga Anusandhana Samsthana, Bangalore. India

Corresponding Author's Email: riyana9745@gmail.com

Date of Submission: 6 Jun 2021 || Date of Acceptance: 11 Dec 2021

## Abstract

Music can influence physical, mental, behavioral, and emotional states. Music has proven to block internal or external stimuli from disrupting one's sleep cycle. There is, however, no thorough review of the appropriate type and mechanism of music for sleep disorders. Here, we have developed a unique model of music that generates a sleep-friendly state, combining with Yogic practices like *Bhramari* and *Yoga Nidra* that induce relaxation, healing sleep disorders. Music therapy is one of the *Ayurveda*-recommended supplemental treatment modalities that work as Mind-Body Medicine.

*Ayurveda*, the ancient science focuses on preventing and treating one's disease conditions, balancing the biological factors (*Doshas*) and psychological components (*Gunas*). Indian *Ragas* help to change one's mental patterns by evoking positives and averting negatives. We have listed the *Ragas* based on Biorhythm theory depicting aesthetic mood as a part of music therapy which helps to balance *Doshas* causing sleep disorders, insomnia, and hypersomnia.

**Keywords:** Insomnia; Hypersomnia; Quality of Life; Ragas; Anidra; Biorhythm theory; Music therapy

## How to cite this article

Sreedharan R, Nagarajan K, Surendran L, Music therapy for sleep disorders based on the Biorhythm theory of *Ayurveda*, Ann Ayurvedic Med. 2021; 10(4) 427-439 DOI:10.5455/AAM. 85491

Annals Ayurvedic Med. 2021; 10 (4) 427-439

## Introduction

According to WHO (World Health Organization), the modified definition of health is equilibrium within the environment, capability, and the possibility of living its spirituality.<sup>1</sup>

According to *Ayurveda*, health is termed *swasthya*. *Sushruta* explains in *Sushruta Samhita* that balanced humor, balanced enzymes, and metabolites, a balanced tissue system, state of excretory functions, along with ecstasy, soul, sense organs, and a mind in equilibrium – such a state is called as a healthy state of a human.<sup>2</sup> According to *Ayurveda*, *Doshas* (*Vata*, *Pitta*, and *Kapha*), psychic elements (*Sattva*, *Rajas*, and *Tamas*), *Dhatu* and *Mala* compile the human body. Wind, fire, and water are the representation of *Vata*, *Pitta*, and *Kapha* respectively. <sup>3</sup>*Sattva*, *Rajas*, and *Tamas* are psychological components that replicate equilibrium, vibrant, and lethargic personality traits, respectively. The

key factor in the causation of disease is the irregularity or vitiation of *Vata*, *Pitta*, and *Kapha*.<sup>4</sup>

*Ayurveda*, the science of life, has a set of principles that must be followed to live a harmless life.<sup>5</sup> The three components, *Ahara* (dietary habits), *Nidra* (sleep), and *Brahmacarya* (celibacy), are listed as three Upastambha (supporting pillars) that play a crucial role in maintaining health.<sup>5</sup>

## Sleep

Sleep is a reversible behavioral state of perceptual detachment from and unresponsiveness to the environment, according to a basic behavioral concept. It can also be defined as a complicated mix of physiological and behavioral processes.<sup>6</sup> The involuntary lack of thought or consciousness is referred to as sleep.<sup>7</sup>

According to *Ayurveda*, *Nidra* means sleep which is a feminine word constructed by the prefix Ni+dra+rak+ta. This is a natural condition that allows a person's

consciousness to be contained. According to *Mandukya Upanishad*, *Nidra* is a state in which “*Atma*” has neither dream nor desire for something, and this state is referred to as “*Sushupti*” which is explained in sloka five of the *Upanishad*. Sleep happens when the *Hridaya* (*Heart*), the seat of *Cetana* (*Consciousness*), is covered by *Tamas*, according to *Acharya Sushruta*. *Acharya Caraka* affirmed that when the mind gets exhausted or becomes inactive and the sensory and motor organs become inactive then the individual gets sleep.<sup>8</sup>

### **Deep sleep according to *Mandukya Upanishad***

According to *Mandukya Upanishad*, there are four stages of consciousness, namely *Jagrat*, *Svapna*, *Sushupti*, and *Turiya* where *Jagrat* is the waking state, *Svapna* is the dreaming state, and *Sushupti* is deep sleep without dream and *Turiya* is transcendental consciousness.<sup>9</sup>

*Sushupti* is a state that resembles dreamless sleep but is not to be mistaken with sleep. There is no mental image in this state, and one’s mind is empty. A Yogi is considered to get to bliss state going through this condition while meditating. The Yogi progresses from *Jagrat* through *Svapna* and *Sushupti* before arriving at *Turiya*, the fourth and final state.<sup>10</sup>

In the 5<sup>th</sup> sloka of *Mandukya Upanishad* on *Deep sleep* or *Sushupti* says: *Na kancana kamam kamayate* – One desires nothing because the mind has withdrawn from both gross and subtle things, *Na kancana svapnam pasyati*– Then that doesn’t dream because the psychic activity has halted, *tat sushuptam*– This is when the mind is fully immersed in itself. However, this absorption is unintentional.<sup>9</sup>

### **Modern stages of sleep**

According to modern science, sleep is divided into two distinct stages physiologically: rapid eye movement (REM) and non-rapid eye movement (NREM). Sleep normally proceeds in cycles in between REM and NREM. The NREM stage is further divided into shallow sleep (stages N1 and N2) and deep sleep (stages N3).<sup>11</sup> The

*Upanishads* says the waking state gives way to dreaming, and the dream state dissolves into deep sleep.<sup>12</sup>

Since REM’s characteristics were found to be associated with the majority of dream episodes, they were considered to define the brain’s dream state.<sup>12</sup> REM sleep is one of the most well-known sleep phases and has traditionally been associated with dreams. We usually report full-fledged and vivid dreams when awoken from REM sleep — an immersive experience during sleep that resembles wakefulness.<sup>13</sup>

NREM sleep is the initial type of sleep that we experience when we fall asleep, and it is divided into three stages: N1, N2, and N3. Because it is so easy to return to awareness during Stages N1 and N2, they are also known as Light sleep. While N1 is more accurately described as a state of drowsiness in which the brain is still functioning at a high rate, N2 causes the brain waves to slow down. Deep Sleep is another name for N3.<sup>13</sup>

Now coming to the correlation between the stages of sleep in scriptures and modern science, the stage of wakefulness is referred to as *Jagrat* in *Upanishads*. *Svapna* (dreaming) stage in the scriptures corresponds to the REM phase of the sleep cycle, when we all dream and our eyeballs flicker. The NREM phase of sleep, during which no dreams occur, is referred to as *Sushupti* in the scriptures and the stage where one can access to universal psyche is referred as *Turiya* or the transcendental stage.<sup>14</sup>

### **Importance of sleep**

Sleep is extremely important for our overall health and well-being. If one gets enough good quality sleep on a regular basis, it will promote one’s physical and mental health as well. It is specifically tailored to memory consolidation.<sup>15,16</sup> Sleep is an important element for the proper functioning of the brain which includes memory retention, hippocampal function, episodic memory,<sup>17</sup> memory encoding,<sup>18</sup> cognition, concentration, performance, productivity,<sup>19</sup> and learning abilities.<sup>20</sup> Whereas sleep deprivation degrades a range of cognitive and brain

functions especially memory performance, it amplifies the risk for numerous diseases,<sup>17</sup> and also elevates homeostatic pressure to the point that waking cognitive functions are impaired even at the time of the peak circadian drive for wakefulness.<sup>21</sup>

The balance of body constituents (*Dhatu Samyam*), alertness, great vision, better complexion, and healthy digestive capacity are all benefits of sleeping at night.<sup>8</sup> According to *Acharya Sushruta*, those who get enough sleep at the appropriate time will not get ill, their thoughts will be calm and cool, they will gain potency and great looks, good virility, their bodies will be appealing, they will not be fragile or obese, and they will live a long and healthier life.<sup>8</sup> For the declarative memory sphere, slow-wave sleep (the deepest sleep stage) has the utmost advantageous result on the consolidation of memories acquired during preceding wakefulness.<sup>21</sup> Disturbances in the sleep cycle regularly can lead to several sleep disorders such as insomnia, hypersomnia, parasomnia, sleep apnea, etc.

### Major Sleep disorders: Insomnia and Hypersomnia

#### Insomnia

Insomnia is a sleep disorder in which the person has trouble falling asleep, finding it difficult to stay asleep, or causing one to wake up too early and then be unable to sleep subsequently.<sup>22</sup> It is a serious predicament concerning poor quality and quantity of sleep.<sup>23</sup> Insomnia is linked to a lower quality of life, a disturbed mood, cognitive deficits, and an increased risk of mental illnesses such as depression and anxiety, and is a serious health concern.<sup>24</sup> Insomnia is categorized as transient (less than a few nights), acute (just under 3-4 weeks), and chronic (more than 3-4 weeks). Transient or acute insomnia is common in people who have never had sleep problems before and is sometimes linked to a specific cause, whereas chronic insomnia is common in people who have permanent shocks, non-curable illnesses, etc.<sup>25</sup>

*Anidra* or *Nidranasha* (insomnia) is the inability to initiate or maintain sound sleep, or getting up early without full sleep and being unable to sleep again, or waking up with

a feeling of fatigue and lethargy.<sup>26</sup>

#### Hypersomnia

Hypersomnia is broadly elucidated by a combination of prolonged night-time sleep episodes, increased overnight waking, frequent daytime dozing, and Excessive Daytime Sleepiness (EDS).<sup>27</sup> According to the International Classification of Sleep Disorders-3, Central hypersomnia is categorized into the following 6 categories: (1) Narcolepsy type 1; (2) Narcolepsy type 2; (3) Idiopathic hypersomnia; (4) Klein Levin syndrome; (5) Hypersomnia due to medical disorder, medication, or substance abuse; and (6) Insufficient sleep syndrome.<sup>28</sup> According to *Ayurveda*, the terms "*Svapnanyata*, *Atinidra*, *Nidraparo*" give the meaning that the patient prefers to sleep for longer periods than the usual or sleeps the majority of the time.<sup>29</sup> Hypersomnia is a neurological disorder characterized by excessive time spent sleeping or excessive sleepiness. According to our ancient classical texts, it leads to obesity and diseases due to increased *Kapha Dosha*, such as diabetes, hypertension, etc.<sup>19</sup>

### Causes of insomnia and hypersomnia

#### Insomnia

Causes of insomnia comprise of an acute medical condition, hospitalization, changes in the sleeping environment, medications, jet lag, and acute or chronic psychosocial stressors.<sup>30</sup> Insomnia can be brought on by a variety of medical and psychological conditions, trauma, poor sleeping patterns, or excessive consumption of stimulants such as coffee, tea, and alcohol. Insomnia may be co-morbid with other serious issues such as anxiety, depression, and certain chronic illnesses.<sup>22</sup> Loss of sleep also can happen as a result of aging, obesity-related sleep apnea, stress, and environmental noise.<sup>18</sup>

According to *Ayurveda*, at the psychological level, the negative sensations of fear, tension, and refusal to embrace the process of life trigger *Anidra*, resulting in an imbalance in the *Vata Dosha* at the physical level.<sup>22</sup>

#### Hypersomnia

Certain medical and neurologic conditions, such as Parkinson's disease,<sup>31</sup> Myotonic dystrophies,<sup>32</sup> Diencephalic tumors, encephalitis, stroke,<sup>33</sup> and so on are known to cause daytime sleepiness. When a patient presents with excessive sleepiness, a pre-existing medical condition is often already established, and diagnosing hypersomnia as a result of a medical condition is relatively straightforward. However, sleepiness can appear before the onset of the other disorder in some cases.<sup>34</sup> According to *Ayurveda*, *Tamas* always causes excessive sleep or *atinidra*.<sup>19</sup>

### **Insomnia and quality of life**

Insomniacs have an even worse quality of life, which continues to deteriorate over time. Due to their lack of sleep, insomniacs become physically and emotionally exhausted, as well as irritable.<sup>30</sup> They become more nervous, anxious, and concerned about health, death, jobs, and personal issues as bedtime approaches. Sleep issues can diminish the health-related quality of life by raising the risk of injuries, malaise, and chronic fatigue. Sleep deficiency impairs cognitive abilities such as memory and attention, as well as psychomotor performance. It is also been related to a higher risk of falling and death.<sup>30</sup> In the presence of other co-morbid medical conditions such as diabetes, hypertension, etc there is ample evidence that insomnia trims down the quality of life and leads to considerable personal costs due to monetary and societal impairment. Insomnia causes functional dysfunction, work absenteeism, impaired attention, memory, and increased medical care utilization. Inadequate sleep has a major impact on the functional impairment of people with psychiatric illnesses.<sup>35</sup>

Melatonin is a hormone produced by the pineal gland in reaction to darkness, giving it the nickname "hormone of darkness".<sup>36</sup> The endogenous melatonin rhythm is closely linked to the sleep tendency rhythm's endogenous circadian portion. As a consequence, it has been suggested that melatonin functions as a "sleep facilitator" in humans.<sup>37</sup> Circadian rhythms are 24-hour cycles of physical, emotional, and behavioral changes.<sup>38</sup> To keep our circadian rhythm stable and better able to help us maintain

healthier sleep we should get up and go to bed at consistent times every day, exercise regularly, and go outside every day to get some fresh air and sunshine.<sup>39</sup> Melatonin is also known as "nature's sleeping pill" because of its presence in sleep-wake cycles, as well as "circadian glue" because of its growing significance in the control of circadian and circannual (yearly cycle) physiological and behavioral functions.<sup>38</sup> Melatonin is also said to be an immune booster,<sup>40</sup> a great biological modulator of mood, sleep and upgrades retinal physiology, sexual orientation, and seasonal-reproductive physiology and behavior.<sup>41</sup> Insomniacs are characterized by a loss of daytime activity, with fatigue, poor work performance, cognitive complaints, emotional distress, and social relationship dysfunction being the most common causes. According to preliminary research conducted, deficiency in social interactions and emotion regulation are serious issues for those who undergo insomnia.<sup>42</sup>

### **Hypersomnia and quality of life**

Hypersomniacs experience major limitations and challenges in everyday activities such as education, work, interpersonal relationships, and social activities as well as a lower quality of life.<sup>43</sup> Patients often complain of lack of motivation, delayed assignments, and difficulties arranging and organizing work tasks and social life, which are often accompanied by prolonged daytime sleepiness and low energy levels.<sup>44</sup> There is ample evidence that hypersomnia reduces the quality of life in the presence of other co-morbid medical conditions such as obesity, depressive illness, and psychiatric disorders.<sup>45</sup> Hypersomnolence has been linked to negative psychosocial effects on employment, education, leisure, personality, interpersonal relationships, marital life, and intimacy in many studies. Due mainly to extreme sleepiness, slower response times, and a trend toward greater objective sleepiness, this disorder appears to be a risk factor for car accidents. Many patients are concerned with indecisiveness, completing tasks, punctuality, arranging and scheduling time, memory and attention problems, low motivation, and decision making. Patients even express concern about traveling by themselves. Fatigue is a serious

obstacle to performing everyday tasks. A recent study found a lack of perseverance and a selective reduction in decision-making performance when faced with uncertainty.<sup>46</sup>

### What is Music and how does it help?

Music is the science and art of assembling tones or sounds in a composition of harmony and consistency by positioning them in sequence, combination, and sequential relationships.<sup>47</sup>

In ancient times music was called “*gandharva*”, later it was called “*gita*” or “*sangita*”. Music is the subtlest and most refined type of fine arts, known in India as *Kala Vidya* in the name of *Sangita*, which consists of the art of singing, dancing, and playing instruments.<sup>48</sup> Music according to *Sangita Ratnakara* is “*Gitam Vadyam tatha Nrtyam trayam Sangitamucyate*” which means, the three arts music, instrument and dance are collectively known as *Music*.<sup>49</sup>

### Music therapy and its elements

Music therapy is an approach in which a music therapist works with an individual or a group to promote and facilitate communication, relationships, learning, and speech by using music and musical elements (sound, rhythm, melody, harmony, and pitch).<sup>50</sup> People cite emotional influence and control as two of the key reasons why they listen to music. Music can induce a wide array of strong emotions, including joy, sorrow, anxiety, and peacefulness or tranquility. Musical satisfaction is closely related to the degree of emotional arousal.<sup>51</sup>

Indian music therapy is an amalgamation of ancient healing techniques and musical traditions.<sup>51</sup> To restore harmony in the physical and mental faculties and remove the imbalances that cause diseases, music therapy primarily employs time-specific *Raga* with a specific tonal quality.<sup>52</sup>

Indian classical music consists of seven key elements *Nada, Sruti, Svara, Raga, Tala, Rasa, and, Thata*. *Nada* refers to a sound that has a consistent quality with a single frequency or a group of similar frequencies.<sup>52</sup>

*Sruti* is a pitch position in an octave that corresponds to a particular frequency.<sup>53</sup> *Svara* is a specific pitch that is related to the fixed tonic and derives its essence from it.<sup>54</sup> *Komal* and *Tivra* are the names given to each note or *Svara* that is either lowered or raised in pitch.<sup>55</sup> *Tala* is the rhythmic pattern.<sup>52</sup> *Raga* is a collection of specially picked tones (*svaras*) that, when blended, express the appropriate mood or emotion.<sup>56</sup> *Rasa* is the essence of our emotions that exist in our body and mind that is capable of representing basic emotions such as love, joy, wonder, courage, calmness, anger, sadness, fear, and disgust.<sup>52</sup> The seat of emotion is mind or psyche, and the basis of *rasa* is an emotional state (*Bhava*) or feeling. Each *Raga* can produce a distinct aesthetic mood or *Rasa*.<sup>57</sup> The term “*Thata*” refers to a scale that has all seven notes in ascending order and descending order sequentially arranged.<sup>58</sup>

### Relationship between music and sleep quality based on different studies

A study shows that listening to Indian music improves sleep quality scores in depressive patients where *Ragas Bahar, Bihag, Mishra Pilu, and Malay Marutam* were used as an intervention.<sup>59</sup> Another study deduced that the *Raga “Nilambari”* of Indian Carnatic music shows no improvement in the sleep architecture or in the subjective feeling of quality of sleep where *Raga “Nilambari”* was given for experimental group which was compared with a control group given *Kalyani Raga*.<sup>60</sup> Another study shows that listening to Indian *Raga “Kapi”* results in increased alertness and decreased arousal level in sleep disorder patients when compared to “*Kalyani*” and “*Nilambari*” *Ragas*. The study suggests “*Kapi*” *Raga* as the finest therapy for sleep disorder patients.<sup>61</sup> A research was conducted on young university students (18-25) who gave music intervention to improve self-worth and sleep quality. *Ragas “Asaveri”* and “*Darbari*” was given for the above respectively and showed significant improvement.<sup>62</sup> A study published looked at the impact of Indian classical music on sleep quality and memory in young adults and found that *Raga “Darbari”* significantly improves sleep quality and memory.<sup>63</sup> There was another study that concluded that

listening to music to the choice of the subjects where they were given the choice between jazz, new-age, ambient, and classical and resulted in the improvement of sleep perception and quality of life but did not show improvement in insomnia severity as hypothesized.<sup>64</sup> A recent study showed that listening to the background music of a collection of classical *adagios* and *enya* with tempo starting at 78 beats per minute to 48 beats per minute, showed significant improvements in sleep duration and sleep efficiency in elementary school children.<sup>65</sup> A different study showed that listening to the “*Drifting into delta track*” from the series of Dr. Lee Bartel before a nap improves the subjective and objective sleep parameters in some patients.<sup>66</sup> A different study signifies that listening to the music of a specific frequency leads to a decrease in sleep latency and an increase in energy of alpha waves (frequency of 12 Hz) at the sleep onset.<sup>67</sup> Another study found that listening to Turkish soft Music (Hicaz and Zirefkend music), helps in improving sleep quality of breast cancer patients.<sup>68</sup> Some other research suggests that listening to soft instrumental music helps to improve the sleep quality of older community-dwelling adults in Singapore.<sup>69</sup> Looking at the above studies we can correlate that the *Ragas* like *Kapi*, *Asaveri*, *Darbari Kanada* using *Ga*, *Ni Komal*, which produces *vira rasa* helps in insomnia. We have substantiated how these *Ragas* create the appropriate aesthetic mood to balance the *Doshas* which causes Insomnia.

A recent study found that listening to soft sedative music which is 60 beats per minute improves sleep duration in young adults.<sup>70</sup> A study shows that *Bhramari* helps in the management of *Anidra*, and is an efficient way to eradicate insomnia when given as add-on therapy.<sup>71</sup> Another study shows that *Yoga Nidra* helps in improving the quality of sleep in cancer patients.<sup>71</sup> A study shows that a yoga module which included dynamic practices, *Asanas*, *Pranayamas*, and *Kriyas* helped in improving personality by increasing their *Sattva Guna* and reducing *Rajas* and *Tamasic* nature.<sup>72</sup>

### The suggested mechanism of music on insomnia and hypersomnia

According to *Ayurveda*, when negative emotions such as fear, sorrow, and disgust persist for a long time, the biochemical environment formed in our bodies is difficult to eliminate and can lead to disease.<sup>73</sup> A study says that fear is the very origin of insomnia.<sup>74</sup> At the psychological level, the negative emotions of fear, anxiety, and refusal to embrace the process of life trigger insomnia.<sup>52</sup> *Ayurveda* says that the imbalance of *Vata Dosha* is the root cause of insomnia and seems to be more common in people with *Vata* constitution.<sup>3</sup> The psychological component of *Vata*, *Rajas*, causes change by interrupting equanimity with passion and agitation, leading to emotional conflicts and, as a result, disrupting sleep quality.<sup>4</sup>

In music therapy, emotional healing is the main technique of treatment. Understanding the metaphysical aspect of one's being will help one heal emotionally. Emotional healing is to eliminate the negative feelings of criticism, anger, guilt, and resentment and replace them with positive thought patterns of affection, compassion, pleasantness, and calmness.<sup>75</sup> The theory of *Samanya Vishesha Siddhanta* (Ch.Su.1/44.45.) in *Ayurveda* is relevant regardless of the medical system that practitioners practice. According to this hypothesis, factors with similar features will lead to an increase in that factor's value. Dissimilar causes result to decline.<sup>76</sup> The disagreeable *rasa* can be replaced with a pleasant *rasa* produced by a specific style of music that displays positive emotion. Willful surrender to the *ragas* from *That Kafi*, *Asaveri*, *Bhairavi* and *Todi* which uses *svaras* or notes *Ga* and *Ni Komal*, develops *vira rasa* or the aesthetic mood of courage in the listener, assist to wipe out these emotions of fear and anxiety, which is the underlying cause of insomnia.<sup>58</sup>

The cause of Hypersomnia is *Kapha* imbalance, the corresponding psychological factors of feeling sadness and disgust which causes emotional stagnation or inertia. According to *Ayurveda*, the main cause of *atinidra* is the dominance of *tamas*<sup>19</sup> which is the psychological component of *Kapha*. The dominance of *Kapha* in the body brings heaviness and excessive sleepiness to the person. The emotion of love helps to eliminate sadness and disgust. *Ragas* from *Kalyan*, *Bilawal* and *Khamaj*

which uses *svaras Ri and Dha Tivra*, creates *shringara rasa* or love in the internal environment.<sup>58</sup>

Table 1 gives *Thāt* and some of its important *Ragas* with prescribed timing to counter insomnia and hypersomnia according to bio-rhythm theory.

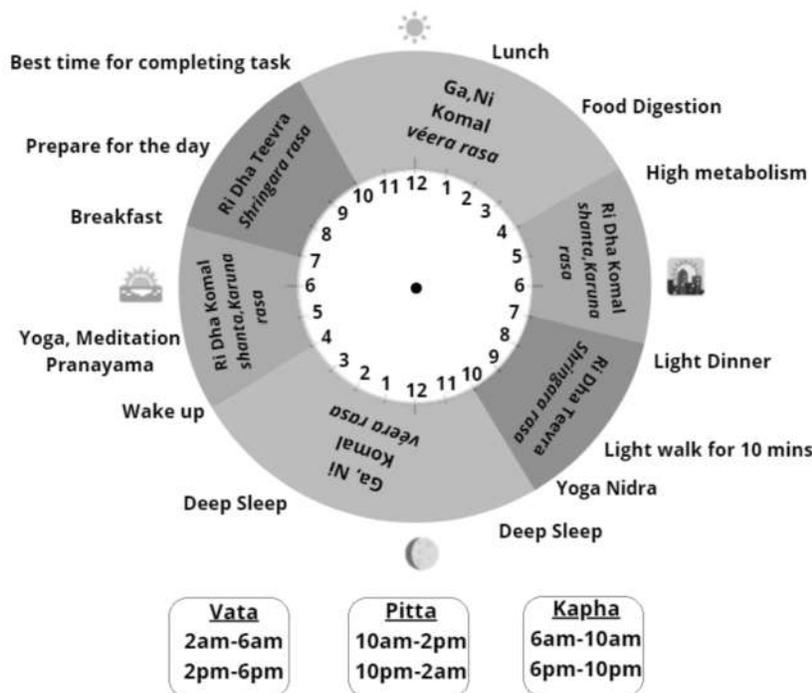
In Indian classical Music, the Time Theory of *Raga* is a fascinating concept which explains that the efficacy of

each *Raga* depends on the time of its application. According to this theory, a 24-hour day is divided into eight *Praharas*(3-hour time periods), with each *Raga* allocated to a particular *prahar*.<sup>51</sup> It can be connected with Ayurvedic analysis of predominance of *Doshas* (*Vata*, *Pitta*, and *Kapha*) at different times of a day as each *Dosha* is said to be predominant during different stages of day and night.<sup>77</sup>

**Table 1: Thāt, Svarās and Rāgās suggested for Insomnia and Hypersomnia according to Biorhythm Theory**

Disturbed Doṣa: (Disorder)	Thāt and svarās used	Some important rāgās of this thāt	Carnatic equivalent	Some important rāgās	Time	Timing	
Vāta doṣa : (Insomnia)	Kāfi : Ga, Ni Kōmal	Kāfi	Kharaharapriya	Kharaharapriya	Anytime		
		Pīlu		Pīlu	Anytime		
		Bhimpalsri		Ābhēri	Afternoon	1pm-4pm	
		Brindāvani Sārang		Pushpalathika	Afternoon	1pm-4pm	
	Asāvēri : Ga, Ni Kōmal	Śuddha Sārang				Afternoon	1pm-4pm
		Asāvēri	Natabhairavi	Natabhairavi	Morning	7am-10am	
		Adāna		Darbāri Kānada	Midnight	10pm-1am	
		Jaunpuri		Jonpuri	Morning	10am-1pm	
	Bhairavi: Ga, Ni Kōmal	Darbāri Kānada		Darbāri Kānada	Midnight	10pm-1am	
		Bhairavi	Hanuma Tōḍi	Sindhubhairavi	Late morning	10am-1pm	
		Malkauns		Hindōḍam	Midnight	10pm-1am	
		Tōḍi : Ga, Ni Kōmal	Bilakshani Tōḍi	Shubhapantuvarāli	Bahaduri Tōḍi	Morning	7am-10am
		Tōḍi		Shubhapantuvarāli	Morning	7am-10am	
		Multāni		Gamakasamandam	Late afternoon	1pm-4pm	
Kapha doṣa : (Hypersomnia)	Kalyān: Ri, Dha Tivra	Śuddha Kalyān	Mēcha Kalyāni	Mohana Kalyāni	Late Evening	7pm-10pm	
		Kēdar		Nīlāmbari	Late Evening	7pm-10pm	
		Hamīr		Hamir Kalyāni	Late Evening	7pm-10pm	
		Yaman		Kalyāni	Late Evening	7pm-10pm	
	Bilawal: Ri, Dha Tivra	Alahiya Bilawal	Dhīrasankarābharanam	Bilahari	Late Morning	10am-1pm	
		Bihāg		Behāg	Night	10pm-1am	
		Śankara		Śankara	Night	10pm-1am	
		Durga		Śuddha Sāveri	Late Evening	7pm-10pm	
	Khamāj: Ri, Dha Tivra	Khamāj		Harikāmbōji	Late Evening	7pm-10pm	
		Jinjoti	Harikāmbōji	Jinjuti, Navroj	Late Evening	7pm-10pm	
	Kalāvati		Valachi	Late Evening	7pm-10pm		
	Deś		Kedāra Gaula	Late Evening	7pm-10pm		

**Fig1: Biorhythm theory and lifestyle prescription according to Āyurveda (Dinacarya)**



According to *Ayurveda*, the human body is composed of five fundamental elements (*Panchamahabhutas*) each of which has its functional rhythm, which is expressed as a day-night routine (*Dinacarya*) in 24-hours and a seasonal schedule (*Ritucharya*) in a year. The theory behind daily routine is to live in a balanced state of three *Doshas*.<sup>78</sup> Fig1 shows the *Dinacarya* of the 24-hour cycle. It explains the complete routine to be followed. Getting up early in the morning benefits the person in two ways: it enhances physical health and boosts mental strength.<sup>79</sup> On this account, we can deduce that practicing *Dinacarya* and *Ritucharya* helps to balance the *Doshas* and thus shield us from illness thereby enhancing longevity.<sup>80</sup>

### Conclusion

Sleep disorders are one of the most prevalent and complex disorders of miscellaneous etiology that may include physical disorders, psychological factors, circadian rhythm disturbances, melatonin dysfunction, etc. According to modern science, there are multiple reasons whereas in *Ayurveda*, it is due to the disturbances in the *Doshas*. It

has multiple effects on one's quality of life, including cognitive abilities such as attention, concentration, memory, as well as physical dysfunction, and social impairment. Insomnia and hypersomnia are the most common sleep disorders, with the former referring to a lack of sleep and the latter to an excess of sleep. Although there are medications, it seems that the majority of them have side effects. As a result, an alternative add-on treatment such as music and Yoga that can help in the reduction of drug use is urgently required.

Music has the power to affect one's physical, psychological, behavioral, and emotional well-being. It can elicit a variety of feelings, which acts as mind-body medicine. In Indian classical music, the main elements are *Raga* and *Rasa*. Each *Raga* induces a different aesthetic mood. According to *Ayurveda*, the key cause of insomnia and hypersomnia is a disruption in the *Vata* and *Kapha Doshas*, with *Rajas* and *Tamas* serving as the psychological components of these *Doshas* respectively. *Ragas* that induce *Vira rasa* can aid in

creating confidence and self-assurance, thereby eliminating the elements of fear and anxiety, the primary metaphysical causes of insomnia. *Ragas* that induce *shringara rasa*, which creates love in the internal environment, can be used on hypersomniacs to alleviate depression and disgust.

Insomnia research reports have shown that a variety of approaches to treat the condition, out of which Ayurveda and Yoga are the ones that give lifestyle prescriptions following the time and seasons and are the most efficient. Studies show that *Bhramari* and *yoga nidra* are effective in treating insomnia. According to a different report, a yoga module that integrated dynamic practices and *Asanas* improved people's personalities by raising their *Sattva Guna* and decreasing their *Rajas* and *Tamasic* nature. Music as an add-on therapy while adapting to the lifestyle changes brings a rhythm of nature as well as attitudinal changes following *Sadvritta* of Ayurveda. can be efficacious in the management of sleep disorders.

## References

1. Nuku G, Ushiga M, Schor XE, Deo S, Hassin J, Hervé C. European Journal of Internal Medicine A new definition of health/ ? An open letter of autochthonous peoples and medical anthropologists to the WHO. 2016. doi:10.1016/j.ejim.2016.06.027
2. Atrideva, Bhaskar Govindji Ghanekar LV. *Sushrut Samhita*. India: Motilal Banarsidass Publishers Pvt. Limited; 2007.
3. Mishra LC, ed. *Scientific Basis for Ayurvedic Therapies*. illustrate. New York: CRC Press, 2003; 2003.
4. David Frawley. *Yoga and Ayurveda – Self Healing and Self Realization*. First indi. Motilal Banarsidas Pvt Ltd., Delhi; 2000.; 1999.
5. Sandeep B, Gajanan P, Rajendra N. Nidranasha (Insomnia) Causes, Consequences & Management an Ayurvedic Perspective. *Int J Herb Med IJHM*. 2013;1(13):68-72.
6. Carskadon, Mary A. and WCD. Normal human sleep: an overview. *Princ Pract sleep Med*. 2005;Chapter-2:16-26.
7. Pranayam B. ASSESSMENT OF NIDRA AS ADHARNIYA VEGA & ITS MANAGEMENT WITH World Journal of Pharmaceutical Research. 2018;(February). doi:10.20959/wjpr20183-10982
8. Kumar S, Raole VV, Tripathi K. Concept of nidra and its physiological aspect on human body Concept of nidra and its physiological aspect on human body. 2019;(June):2625-2628.
9. Swami Krishnanada. *THE MÂNDÛKYA UPANISHAD*. Rishikesh: THE DIVINE LIFE SOCIETY; 1996.
10. Kumar VM. Sleep Medicine in Ancient and Traditional India. 2016;(August). doi:10.1007/978-1-4939-2089-1
11. Wu H, Talmon R, Lo Y. Assess Sleep Stage by Modern Signal Processing. 2014;11(4). doi:10.1109/TBME.2014.2375292
12. Mukhopadhyay AK. REM sleep and dream sleep: are they identical? Exploring the conceptual developments in the Upanishads and the present knowledge based on the neurobiology of sleep. 2015;(January 2011).
13. Sánchez AA. Conscious states during dreamless sleep/ : A philosophical and psychological. 2019.
14. Singh PK, Opinion S, Singh PK, Mohanta N, Pradesh U. Available online through. 2019;7(2):21-25. doi:10.7897/2321-6328.072106
15. Abel T, Havekes R, Saletin JM. Sleep , Plasticity and Memory from Molecules to Whole-Brain Networks. *CURBIO*. 2013;23(17):R774-R788.

doi:10.1016/j.cub.2013.07.025

16. Rasch B, Born J. ABOUT SLEEP ' S ROLE IN MEMORY. 2021:681-766. doi:10.1152/physrev.00032.2012
17. Chai Y, Fang Z, Yang FN, et al. Two nights of recovery sleep restores hippocampal connectivity but not episodic memory after total sleep deprivation. 2020:1-11. doi:10.1038/s41598-020-65086-x
18. Werf YD Van Der, Altena E, Vis C, et al. Sleep benefits subsequent hippocampal functioning. 2009;12(2):2008-2009. doi:10.1038/mn.2253
19. Sabharwal P, Ekka SS, Gaur MB, Pandey YK, Sharma AK. A SCIENTIFIC AYURVEDIC EXPLORATION OF CONCEPT OF SLEEP ( NIDRA ) INTERNATIONAL A SCIENTIFIC AYURVEDIC EXPLORATION OF CONCEPT OF SLEEP ( NIDRA ). 2018;(June).
20. Feld GB, Diekelmann S. Sleep smart — optimizing sleep for declarative learning and memory. 2015;6(May):1-11. doi:10.3389/fpsyg.2015.00622
21. Tucker MA, Summer T, Wamsley E. Comparing the Effects of Sleep and Rest on Memory Consolidation. *Nat Sci Sleep*. 2020;12:79-91. doi:10.2147/NSS.S223917
22. Tiwari S, Talreja S. Insomnia: A Study on Sleeping Disorder with the Reference of Ayurvedic Herbs. *J Pharm Sci Res*. 2020;12(11):1375-1379.
23. Chang ET, Lai HL, Chen PW, Hsieh YM, Lee LH. The effects of music on the sleep quality of adults with chronic insomnia using evidence from polysomnographic and self-reported analysis: A randomized control trial. *Int J Nurs Stud*. 2012;49(8):921-930. doi:10.1016/j.ijnurstu.2012.02.019
24. Riemann D, Nissen C, Palagini L, Otte A, Perlis ML, Spiegelhalder K. The neurobiology, investigation, and treatment of chronic insomnia. *Lancet Neurol*. 2015;14(5):547-558. doi:10.1016/S1474-4422(15)00021-6
25. Rajput, Vijay and SMB. Chronic Insomnia/ : A Practical Review. *Am Fam Physician*. 1999:1-14.
26. Ramani VD, Chuhan S, Joshi J, Ghelan T. Pharma Science Monitor. *Pharma Sci Monit*. 2011;2(4):1135-1151.
27. Kaplan KA, Harvey AG. Hypersomnia across mood disorders/ : A review and synthesis. *Sleep Med Rev*. 2009;13(4):275-285. doi:10.1016/j.smrv.2008.09.001
28. Urade Y. Neurobiological Basis of Hypersomnia. 2017. doi:10.1016/j.jsmc.2017.03.003
29. Ariyaratne SR KR. CORRELATION OF MAJOR DEPRESSIVE DISORDER AND KAPHAJA UNMADA. *Unique J Ayurvedic Herb Med*. 2015;03(5):1-6.
30. Kamel NS, Gammack JK. Insomnia in the Elderly/ : Cause , Approach , and Treatment. *Am J Med*. 2006:463-469. doi:10.1016/j.amjmed.2005.10.051
31. Chahine LM, Amara AW, Videnovic A. Running title/ : Sleep Disorders in Parkinson ' s Disease. *Sleep Med Rev*. 2016. doi:10.1016/j.smrv.2016.08.001
32. Laberge L, Gagnon C, Dauvilliers Y. Daytime Sleepiness and Myotonic Dystrophy. 2013. doi:10.1007/s11910-013-0340-9
33. Bassetti C, Aldrich MS. Idiopathic hypersomnia A series of 42 patients. 1997:1423-1435.
34. Trotti LM. Idiopathic Hypersomnia. *Clin Sleep*

- Med.* 2017;14. doi:10.1016/j.jsmc.2017.03.009
35. Harvey AG. Insomnia , Psychiatric Disorders , and the Transdiagnostic Perspective. *Curr Dir Psychol Sci.* 2008;17(5):299-303. doi:https://doi.org/10.1111%2Fj.1467-8721.2008.00594.x
  36. Masters-israilov A, Pandi-perumal SR, Seixas A, Jean-louis G, Mcfarlane SI. Melatonin , the Hormone of Darkness/ : From Sleep Promotion to Ebola Treatment Brain Disorders & Therapy. 2014;4(1):4-7. doi:10.4172/2168-975X.1000151
  37. Cajochen C, Kra K. Role of Melatonin in the Regulation of Human Circadian Rhythms and Sleep. *J Neuroendocrinol.* 2003;15:432-437. doi:https://doi.org/10.1046/j.1365-2826.2003.00989.x
  38. Kumar V. Melatonin/ : A master hormone and a candidate for universal panacea. *Indian J Exp Biol.* 1996;34(November):391-402.
  39. Cae IB. Sleep in a time of pandemic - a position statement from the national sleep foundation. *Sleep Heal J Natl Sleep Found.* 2020;6(3):431. doi:10.1016/j.sleh.2020.05.003
  40. J.J. Pozaa, M. Pujol b, J.J. Ortega-Albás c OR d. Melatonin in sleep disorders. *Neurologia.* 2020. doi:10.1016/j.nrleng.2018.08.004
  41. Beyer CE, Steketee JD, Saphier D. Antioxidant Properties of Melatonin — An Emerging Mystery. *Biochem Pharmacol.* 1998;56(98):1265-1272. doi:https://doi.org/10.1016/S0006-2952(98)00180-4
  42. Simon D. Kyle, Louise Beattie, Kai Spiegelhalder, Zoe Rogers AE. Altered Emotion Perception in Insomnia Disorder. *Sleep.* 2014;37(4):775-783. doi:10.5665/sleep.3588
  43. Ozaki A, Inoue Y, Hayashida K, Nakajima T, Honda M. Quality of life in patients with narcolepsy with cataplexy , narcolepsy without cataplexy , and idiopathic hypersomnia without long sleep time/ : Comparison between patients on psychostimulants , drug-naïve patients and the general Japanese population. *Sleep Med.* 2012;13(2):200-206. doi:10.1016/j.sleep.2011.07.014
  44. Backlund H, Bornstein A, Wasling P. Quality of life and procrastination in post-H1N1 narcolepsy , sporadic narcolepsy and idiopathic hypersomnia , a Swedish cross-sectional study. *Sleep Med.* 2020;76:104-112. doi:10.1016/j.sleep.2020.10.014
  45. Plante DT. Hypersomnia in Mood Disorders/ : a Rapidly Changing Landscape. 2015:122-130. doi:10.1007/s40675-015-0017-9
  46. Goswami M. Quality of Life in Narcolepsy. *Clin Sleep Med.* 2012;7(2):341-351. doi:10.1016/j.jsmc.2012.03.006
  47. Murrock CJ, Higgins PA. The theory of music , mood and movement to improve health outcomes. 2009:2249-2257. doi:10.1111/j.1365-2648.2009.05108.x
  48. Debendra Narayan Satapathy, Sanjay Kumar Satapathy RDW. Effect of Music on Sleep Disorders-A Review. *J Ayurveda Physicians Surg.* 2018;5(3):100-102.
  49. ÚârEgadeva. *SaEgîta-Ratnâkara of ÚârEgadeva Sanskrit Text and English Translation with Comments and Notes · Volume I.* (Prem Lata Sharma RKS, ed.). Munshiram Manaharlal; 2007.
  50. Lars Ole Bonde TW. *A Comprehensive Guide to Music Therapy: Theory, Clinical Practice, Research and Training.* London: Jessica Kingsley Publishers, 2002; 2002. https://books.google.co.in/books?id=iWWYrTf0%5C\_VkC.

51. Sundar S. Traditional healing systems and modern music therapy in India. *Music Ther Today*. 2007;8(3):397-407.
52. Nagarajan K. *An Introduction to Indian Music Therapy*. Independently published (May 17, 2021); 2021.
53. Vidwans V. *The Doctrine of Shruti in Indian Music*. Pune: Flame University, Pune; 2016.
54. TM Krishna VI. *2 Nd CompMusic Workshop*. (Xavier S, Rao P, Hema M, Bozkurt B, eds.). Istanbul: Universitat Pompeu Fabra; 2012.
55. Karuna N. MUSIC THERAPY BASED ON INDIVIDUAL 'S' ' BIOLOGICAL HUMOR ' – WITH REFERENCE TO MEDICAL ASTROLOGY/ : A REVIEW. *Int Ayurvedic Med J*. 2014;2(4).
56. Kar SK, Ganguly T. Effect of Indian Classical Music (Raga Therapy) on Fentanyl, Vecuronium, Propofol Requirements and Cortisol levels in Cardiopulmonary Bypass. *J Anesth Crit Care Open Access*. 2015;2(2). doi:10.15406/jaccoa.2015.02.00047
57. Prasad G. *I.A. Richards and Indian Theory of Rasa*. Delhi: Sarup & Sons, 1994; 1994. <https://books.google.co.in/books?id=hmy5cnSbsWYC>.
58. Sobhana Nayar. *Bhatkhande's Contribution to Music: A Historical Perspective*. Bombay: Popular Prakashan, 1989; 1989.
59. Deshmukh AD, Sarvaiya AA. Nordic Journal of Music Therapy Effect of Indian classical music on quality of sleep in depressed patients/ : A randomized controlled trial. *Nord J Music Ther*. 2009;18:37-41. doi:10.1080/08098130802697269
60. GITANJALI B. EFFECT OF THE KARNATIC MUSIC RAGA " NEELAMBARI " ON SLEEP ARCHITECTURE. *Indian J Physiol Pharmacol*. 1998;42(1):119-122.
61. Adalarasu, Kanagasabai, Mohan Jagannath and NKR. EEG based Neurophysiological responses to music among sleep disorder patients. *Int J Recent Sci Res*. 2012;3(5):360-365.
62. Mamta Sharma AS. DISTURBED SLEEP PATTERNS AND SELF WORTH IN YOUTH/ : A MUSIC THERAPY INTERVENTION. *Voices Res*. 2015;4(3):28-32.
63. Amritharekha P. Nayak, Vishrutha K .V. VKRN. Effect of Indian classical music microtones on sleep quality and memory in young adults. *Biomedicine*. 2020;40(1):76-82. doi:<https://doi.org/10.51248/v40i1.109>
64. Jespersen KV, Vuust P. REGUL AR RESE ARCH PAPER A randomized controlled trial of bedtime music for insomnia disorder. 2019;(November 2018):1-11. doi:10.1111/jsr.12817
65. Tan LP. The Effects of Background Music on Quality of Sleep in Elementary School Children. *J Music Ther*. 2004;41(2):128-150. doi:10.1093/jmt/41.2.128
66. Cordi MJ, Ackermann S, Rasch B. Effects of Relaxing Music on Healthy Sleep. *Sci Rep*. 2019;1-9. doi:10.1038/s41598-019-45608-y
67. Dubey P, Kumar Y, Singh R, Jha K, Kumar R. Effect of music of specific frequency upon the sleep architecture and electroencephalographic pattern of individuals with delayed sleep latency/ : A daytime nap study. *J Fam Med Prim care*. 2019;8(12):3915-3919. doi:10.4103/jfmpc.jfmpc
68. Diðdem Lafçi GÖ. The Effect of Music on The Sleep Quality of Breast Cancer Patients. *Int J caring Sci*. 2015;8(3):633-640.
69. Shum A, Joan B, Thayala J, Fai M. The effects of sedative music on sleep quality of older

- community-dwelling adults in Singapore. *Complement Ther Med.* 2014;22(1):49-56. doi:10.1016/j.ctim.2013.11.003
70. Chih-Kuang Chen, Yu-Cheng Pei, Ning-Hung Chen, Li-Ting Huang, Shih-Wei Chou, Katie P. Wu, Pei-Chih Ko, Alice M.K. Wong and C-KW. Sedative Music Facilitates Deep Sleep in Young Adults. *J Altern Complement Med.* 2014;20(4):312-317. doi:10.1089/acm.2012.0050
71. Divya N Anand , Linu Sara George AR. Effectiveness of Yoganidra on quality of sleep among cancer patients. *Manipal J Nurs Heal Sci.* 2015;1(November):30-33.
72. Amaranath B, Nagendra HR, Deshpande S. Journal of Ayurveda and Integrative Medicine Effect of integrated yoga module on personality of home guards in Bengaluru/ : A randomized control trial. *J Ayurveda Integr Med.* 2016:2-5. doi:10.1016/j.jaim.2015.11.002
73. Peter Marchand. *The Yoga of the Nine Emotions: The Tantric Practice of Rasa Sadhana.* illustrate. Inner Traditions / Bear & Co, 2006; 2006.
74. Perogamvros L, Castelnovo A, Samson D. Failure of fear extinction in insomnia/ : An evolutionary perspective. *Sleep Med Rev.* 2020;51:101277. doi:10.1016/j.smr.2020.101277
75. Karuna N, Srinivasan TM, Hr N. Review of Râgâs and its Rasâs in Indian music and its possible applications in therapy. *Int J Yoga-Philosophy, Psychol Parapsychol.* 2013;1(1):21-28. doi:10.4103/2347-5633.123288
76. Loon G Van. *Charaka Samhita Handbook on Ayurveda.* Vol I. Varanasi: Orientalia Publishers; 1981.
77. Devanand Upadhyay RM. REVIEW OF MUSIC AND ITS THERAPEUTICS W.S.R. AYURVEDIC CLASSICS (BRIHATRAYEE). *Indian J Agric Allied Sci.* 2016;2(1):114-118.
78. Kaushik B, Sharma DN, Sharma UK, Bhatkoti M, Bishwal R. ROLE OF AYURVEDIC DINACHARYA IN PROMOTION OF HEALTH. *J Vishwa Ayurved Parishad.* 2018;(December):30-35.
79. Akshar Kulkarni AJ. REMUNERATION OF PURSUING DINACHARYA. *Jnana Srotas.* 2014;9(2).
80. Megha Murali, Ragini Kumari, Kirti Soni SK. International Journal of Ayurveda. *Int J Ayurveda Pharma Res.* 2020;8(12):37-42. doi:https://doi.org/10.47070/ijapr.v8i12.1661

**Source of Support : Nil  
Conflict of Interest : None**