

Effects of Yogic Lifestyle on Human Circadian Rhythm – A Brief Review

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Abstract: *Yoga is an ancient Indian lifestyle which provides structured guidelines for healthy living. Yogic lifestyle helps to improve overall wellness by relieving stress, supporting good health habits, and improving mental/emotional health, sleep, and balance. (1) Modern man is adopting anti-nature lifestyle that hampers routine activities optimally results in reduction of physical, mental and social health. (2) Studies suggest yogic lifestyle is very beneficial for disease prevention and rehabilitation. (3) Yogic lifestyle emphasizes on following a disciplined guidance from waking up in the morning till going to sleep in night, one indulges in multiple routine activities. (reference) Yogic lifestyle necessarily comprises Ahara (food), Vihara (recreation), Achara (conduct), Vichara (thinking), and Vyavahara (behaviour) (4) Circadian rhythms are physical, mental, and behavioural changes that follow a daily cycle. A circadian rhythm is a natural, internal process that regulates the sleep-wake cycle and repeats roughly every 24 hours. (5) Mental alertness, hunger, stress, mood, heart function, and even immunity are also influenced by the body's daily rhythms. (6) Yogic lifestyle seems like an essential manual to balance human circadian rhythm. In despite of its importance this are is widely unexplored and lacks scientific evidence. This review papers aims to explore possible correlation of Yogic lifestyle on Human Circadian Rhythm.*

Aim 1. Objectives to understand the effect of yogic lifestyle on the different aspect of circadian rhythm 2. To establish the theoretical framework of circadian rhythm and yogic lifestyle 3. To check efficacy and validation of Yogic lifestyle in the management of human Circadian Rhythm

Conclusion – The review it has been suggested that yogic lifestyle effects circadian rhythm in the positive manner. Sleep wake cycle is majorly fixed by the yogic lifestyle followed by behavioural modification and appetite. Apart from the evidences future directions are to perform randomised controlled trials on physiological level to access the impacts.

Keywords: Yoga.

I. INTRODUCTION

Circadian rhythms are physical, mental, and behavioural changes that follow a daily cycle. Sleeping at night and being awake during the day is an example of a light-related circadian rhythm. Sleep is an important part in our daily cycle by which our body gets enough rest and rejuvenation. Poor sleeping pattern or lack in sleep play major negative impact on our body as it disturbs our metabolism, body healing, memory consolidation, Mental alertness, hunger, stress, mood, heart function, and even immunity. In yoga, Maharishi Patanjali talks about discipline in his ashtanga yoga and in very first sutra i.e. **Atha yoganushasanam** – The disciplines of Yoga mentioned in Patanjali Yoga Sutra are Shasana and Anushasana. Anushasana is the rule you impose upon yourself. It is nobody's imposition; it is self-imposed. There is a lot we impose on ourselves every morning we wake up with to sun and sleep with moon. This is our discipline that leads to a healthy living.

Ashtanga yoga or Raja yoga is a wide range of techniques that slowly harmonize the mind and helps you lead a harmonious days and life. Ashtanga yoga i.e. eight stages are : 1. Yama, 2. Niyama, 3. Asana, 4. Pranayama, 5. Pratyahara, 6. Dharna, 7. Dhyana, and 8. Samadhi. In these the first four practices leads us to create discipline and it must help us maintaining a healthy circadian rhythm. Ahara , vihar, achar, vichar and vyavhara all five play a significant role in balancing our rhythm. Proper sleep/wake cycle play the significant role that gets in balance with the help of above techniques.

We have to take care of all the pillars equally to be able to lead a healthy and happy life that must help in our daily cycle and rhythm. If even one of them is ignored then we shall bear a disorganised lifestyle leading us to variable sleeping pattern.

Circadian cycle regulates Body functions like Sleep-wake cycle, body temperature, activities such as eating and drinking, hormonal and neurotransmitter secretion etc. The circadian cycle is controlled by a part of the hypothalamus called the supra-chiasmatic nucleus (SCN), which is the master centre for integrating rhythmic information and establishing sleep patterns. Cyclical fluctuations of melatonin, produced by pineal gland, are also vital for maintaining a normal circadian rhythm.

1.1 Aim & Objectives

This review paper aims to understand the concept of circadian rhythm in yoga and modern view, its physiological and pathological aspects, its role in the prevention and management of such disorders.

II. MATERIAL AND METHOD

Literature search were carried out in Modern system and relevant databases like Google Scholar, PubMed, Shodhganga and some relevant google articles etc. Search revealed a total of 8450 articles, among them 59 relevant articles were taken, of which abstracts and full paper of some most relevant and freely downloadable articles were reviewed.

III. LITERATURE REVIEW

From chapter 6, verse 17

yuktāhāra-vihārasya
yukta-ceṣṭasya karmasu
yukta-svapnāvabodhasya
yogo bhavati duḥkha-hā

Those who are temperate in eating and recreation, balanced in work, and regulated in sleep, can mitigate all sorrows by practicing Yog.

Yoga is the union of the jivatma with parmatma. The opposite of Yog is *bhog*, which means engagement in sensual pleasures. Indulgence in *bhog* violates the natural laws of the body, and results in *rog* (disease). In this verse, Shree Krishna states that by being temperate in bodily activities and practicing Yoga, we can become free from the sorrows of the body and mind. Eating healthy and right food in minimal quantity can lead to complete positive and good life. He who is mild in his habits of eating, working, sleeping, and fun activities can reduce all material pains by practicing the yoga.

From chapter 2, verse 50

buddhi-yukto jahātīha ubhe sukṛita-duṣkṛite
tasmād yogāya yujyasva yogaḥ karmasu kauśhalam

Yoga is Skill in action. The Skill is in maintaining relaxation and awareness in action. Relaxed action is the process. Regular Planning in action is an outcome. Thus Yoga is skill in action and ability to stay mastery over the mind. "Yoga is art and science of Healthy Living". At the point when you practice calmness in mind and being able to concentrate on one thing, you can understand something and takes decisions with right knowledge at ideal time. Whatever work you do will be fruitful when you do with dedication and commitment. This helps one to live purposefully in every movement of life. That also helps in taking positive decision and positive thinking, moderate in eating and sleeping, working sincerely for right goal.

IV. PATHYA AND APATHYA IN HATHYOGAPRADEEPIKA

- **Apathya/ Un-Wholesome food:** The foods which are restricted (for the yogi) are: those which are, sour, bitter, salty, heating, green vegetables (other than those ordained), oil, sesame and mustard, alcohol, fish, flesh foods, curds, buttermilk, oil cakes and garlic. Undesirable eating routine ought not be taken, what is warmed subsequent to getting cold, which is dry (without common oil), which is too much salty or acidic, has too much (blended) vegetables. These eating habits lead to poor lifestyle that further disturbs your daily routine and circadian rhythm.

- **Pathya/Wholesome food:** The most helpful food for the yogi are: acceptable grains, wheat, rice, grain, milk, ghee, sugar sweets (solidified sugar), dry ginger, natural product (types of cucumber), five vegetables and such pulses, and pure water. The yogi should take nourishing and sweet food mixed with, milk and ghee; it ought to sustain the dhatus (basic body constituents) and be satisfying and suitable. Yogic scriptures firmly discourage habit of Over-eating and inspiring moderation of diet. Yogic literature on the Indian philosophy which says that additional (surplus) of anything is worthless; it strongly suggests diet must be taken with some limitation and overeating should be kept away at all cost.
- **Patanjali Ashtanga Yoga:** Ashtanaga Yoga is a mode of Yoga which consist of Eight Limbs or Steps i.e. Yama, Niyama Asana, Pranayama, Pratahar Dharna Dhyana Samadhi have been found to control the mental modification thereby helping in attaining good health.
- **The Yamas :** The word 'yama' is often translated as 'restraint', 'moral discipline' or 'moral vow', and Patanjali states that these vows are completely universal, no matter who you are or where you come from, your current situation or where you're heading. To be 'moral' can be difficult at times, which is why this is considered a very important practice of yoga. Remember that the word 'yoga' means 'unity', 'wholeness' or 'connectedness'; of course it's important to be mindful, gentle and present in class, but if this doesn't translate off the mat and connect into what we do in our day-to-day lives, we will never feel the real benefits of yoga.

The Yamas traditionally guide us towards practices concerned with the world around us, but often we can take them as a guide of how to act towards ourselves too. There are five Yamas in total listed in Patanjali's Sutras:

Ahimsa (non-harming or non-violence in thought, word and deed), Satya (truthfulness), Asteya (non-stealing), Brahmacharya (celibacy or 'right use of energy') and Aparigraha (non-greed or non-hoarding)

Other texts describe further Yamas, for example the Śāṅḍilya Upanishad lists a total of 10 Yamas, excluding Aparigraha but including: Ksama (forgiveness), Dhrti (fortitude), Daya (compassion), Arjava (non-hypocrisy, or sincerity), Mitahara (measured diet), and Saucha (cleanliness).

- **The Niyamas:** The word 'Niyama' often translates as 'positive duties' or 'observances', and are thought of as recommended habits for healthy living and 'spiritual existence'. They're traditionally thought of as practices concerned with ourselves, although of course we can think of them as affecting the outside world too. Patanjali lists a total of five Niyamas, but again there are other traditions and texts that list more:
- **Saucha** (cleanliness), **Santosh**a (contentment), **Tapas** (discipline, austerity or 'burning enthusiasm')
- **Svadyaya** (study of the self and of the texts) and **Ishvara Pranidhana** (surrender to a higher being, or contemplation of a higher power)
- **ASANA:** Asana means a state of being in which one can remain physically and mentally steady, calm, quiet and comfortable. In the Yoga Sutras of Patanjali there is a concise definition of yogasanas: "Sthiram sukham aasanam", meaning that position which is comfortable and steady

In raja yoga, asana refers to the sitting position, but in hatha yoga it means something more. Asanas are specific body positions which open the energy channels and psychic centres. They are tools to higher awareness and provide the stable foundation for our exploration of the body, breath, mind and beyond. The hatha yogis also found that by developing control of the body through asana, the mind is also controlled, Therefore, the practice of asana is foremost in hatha

4.1 Significance of Hath Yoga practices in Health promotion

- **Improve Cardiovascular Fitness:** Hatha Yoga improves cardiovascular wellness and fitness. Regular practice of yogasana helps to normalize the blood pressure. The regular practice of Hatha Yoga postures are effective in controlling the disease related to heart.
- **Improve Digestive System:** The digestive fire or agni is stimulated. This increases the appetite and balances the metabolism. Asanas stretch the body, massaging the abdominal. This causes food to move efficiently along the digestive tract. Bowel movement is regulated and constipation relieved.
- **Improvement in Nervous System:** The Hatha Yoga practice helps to improve sympathetic nervous system and maintains homeostasis (stability) in the body. The Parasympathetic nervous system of human body are brought into lowers the blood pressure and heart rate by practicing yogasanas regularly.

- When our major systems that are Cardiovascular, Digestive, Nervous System are in a healthy and firm state, it is more likely to have a better circadian rhythm.

4.2 Factors Influencing Circadian rhythm

Achar, my behaviour/conduct with others should be loving, caring and cordial at all times. More important is *Vichar*, my way of thinking – we can be negative, or positive or neutral, in that order. We should convert our negative thoughts into positive and if we are unable to be positive then we should try to be neutral, but never to allow anything to disturb us. Let's make an effort to absorb this method deep into our daily lives. Today we have learnt of the five pillars – *Ahar*, *Vihar*, *Achar*, *Vichar*, *Vavyahar*

We have to take care of all the four pillars equally to be able to lead a healthy and happy life. If even one of them is ignored then we shall bear pain, disease and suffering to some intensity. This thought has been reiterated not only in the Yoga Sutras but in Ayurveda and the Bhagwad Gita as well.

V. DISARRANGEMENT IN CIRCADIAN RHYTHM

When we have an improper cycle for food intake i.e. Ahara that includes what we eat, the quality and quantity both play significant role. It is a saying in our culture, “Jesa Ann, Wesa Mann” that mean “You are what you eat” and thus it is very important to consider the things that goes inside your body. In the kind of food that one should ideally go for are ‘pathya’ we have discussed above. The timing of intake of food for breakfast, lunch and dinner must be ideal and performed punctually as our body too needs time for digestion. That is how our metabolism become strong, by punctuality in eating sathvik food that leads our body and mind to a healthy state maintaining our circadian rhythm. Awareness while eating is the most vital practice that everyone should follow as now days, people watch television or any social media while having food. By this the energy we give to food become tamsik and the food fails to energize completely. What we eat, when we eat and how we eat all three simultaneously play vital role in subject of Ahara and in maintaining a healthy beautiful body and mind that leading us to model circadian rhythm.

Vihar i.e. our rest or recreation time that includes all Niyams that represent self discipline guideline. Saucha (cleanliness), Santosh (contentment), Tapas (austerity), Swadhaya (self study) and Ishwarpranidhan (surrender). These all provide a sense of discipline in our life and develop our vihar.

Achar i.e. our code of conduct with external world those are *Yamas* – *Ahimsa* (non-violence), *Satya* (Truth), *Asteya* (non-stealing), *Brahmacharya* (moderation in seeking pleasures), *Aparigraha* (non-stealing) The practicing of Yama will help in developing peace and harmony in the society.

Vichar – our goals in life, our school of thought. The kind of thoughts we create whether negative or positive rules our mind.

Vyavhara – behavioural aspect of being with ourselves and other human.

The sleep/wake cycle is necessary to replenish and heal the body to ensure that it can function properly. Proper sleep allows the body to engage in circadian rhythms in the body, which initiates the build-up of energy stores for metabolic processes, neuronal remodeling for synaptic function, memory consolidation, and the assimilation of complex motor systems. The central nervous system (CNS) plays a critical role during the sleep cycle. As a result of the activation of the circadian system, the reticular activating system (RAS) in the brain stem is inhibited from inducing sleep. Sleep regulation is distinguished by the balance between the internal sleep homeostasis (process S) and the external circadian drive (process C).

VI. RESULT AND DISCUSSION

Based on the content from the reviewed papers, the summary of methods in yogic science to be followed to maintain proper circadian rhythm and management of disorders caused by its derangement is as follows. By following proper ahara, eating healthy and pathya food in quantity as per described in hath yoga i.e. half stomach fill with food, one-fourth fill with water and the other one-fourth fill with air. Healthy body leads to a healthy mind and taking proper diet is a crucial part of leading a healthy lifestyle. Yoga is not just about doing asanas and meditation, Diet is also a very crucial part of it. When diet gets appropriate time for digestion, it assimilates properly and gives productive result on positive health. Eating a particular type of diet generates similar kind of behaviour. It is also important to consider the thoughts

that are in your mind while you are eating. It is advisable to do nothing else while eating as the mind needs to be attentive of what and how much of it you are eating for proper and easy digestion. Proper diet and eating habits will reduce negative thoughts, make your mind calmer and improve your body's vitality to live better quality life.

Our biological clock is set according to the sunrise-sunset. When the sun is right above us, our digestive fire performs at its peak. The food eaten at night time does not get properly digested since the digestive system becomes inactive during the night owing to the absence of sunlight and we face the problem of indigestion. The metabolism rate slows down during these hours as we do not indulge in any physical activity which helps in digestion. Hence, due to these reasons the food taken during night times does not get digested; and its putrefaction in the body is harmful to health.

The Yama (social code) and Niyama (personal code) aim to break this vicious circle and thereby calm the mind by sensible actions and sensible attitudes towards oneself, towards one's life and towards one's surroundings. Asana release mental tensions by dealing them on physical level, acting somato-psychically, through the body to the mind. Regular practice of asanas maintain the physical body in optimum condition and promotes health even in an unhealthy body. The body become full of vitality and strength and the mind becomes light, creative, joyful and balanced. Yogasana have often been thought of as a form of exercise. They are not exercises but techniques which place the physical body in position that cultivate awareness, concentration and meditation. Yoga Asanas have a profound impact on the systems of the human body. The muscles, bones, nervous system, respiratory, circulatory and digestive systems of the human body are greatly benefited from regular **practice of Yoga Asanas**. The body becomes more flexible, and more able to adjust to environmental changes after practising asanas.

Asanas keep the mind calm and at ease. Yoga Asanas regulate and control the secretion of hormones from all glands in the body. Maintaining sleep/wake cycle is must to get our circadian rhythm in order. Over 55% of yoga practitioners report improved sleep. Many studies demonstrate that yoga can improve sleep for a variety of different populations. These studies typically focus on one's quality of sleep rather than the quantity, as increased amounts of sleep do not necessarily correlate with quality sleep and overall wellbeing.

When it comes to how yoga can help improve the quality of sleep:

Mindfulness. This is a practice of judgment-free awareness in the moment. Mindfulness is a common component of many types of yoga. Mindfulness can increase melatonin levels and reduce nighttime sleep disturbances in adults. Breathing awareness and regulation. These are also elements of yoga. Deep breathing is a relaxation technique that can induce sleep. Regular asana practice. Frequent movement is an important element of sleep hygiene. Moderate asana several times a week can improve overall sleep. From the point of view of Yoga, a healthy person has a body that has the wealth of the body (kaya sampat), the vitality of the breath, the peace of mind, positive attitudes and a healthy expression of emotions. Yoga prescribes four major approaches to a healthy living. Ahara, healthy diet, vihar, a healthy and spiritually conscious lifestyle, bhavana, healthy and positive attitudes towards oneself and the world, and finally sadhana or abhyasa, practices which include engaging the body, breath, and mind. In sadhana we have tools such as asana, pranayama, mudra, etc.

VII. CONCLUSION

Yoga practices are very influential in management of circadian rhythm when practiced regularly. It can bring various improvement in various parameter. In context to present era where people are working day & night with irregularities in diet, lifestyle disorders and psychological illness are contributing to the disturbance in circadian rhythm that are leading to major health problems and diseases. We can enhance our health, lifestyle, mood, mental alertness, immunity and healing by aligning our circadian rhythm. By adapting yogic lifestyle one can experience major improvement. Proper ahara i.e. dietary regimen, vihar, vichar (thinking), achara (conduct) etc. also by inducing in proper asana and mindfulness practices one can maintain the sleep/wake cycle in order to align circadian rhythm. The various chronic health conditions linked to irregular rhythms include diabetes, obesity, depression, bipolar disorder, seasonal affective disorder, and other sleep disorders. Yogic lifestyle must help to overcome such disorders.

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