



## **Investigation of effect of Mood, Sleep, Depression, Social Activities on Circadian Cycle**

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### **ABSTRACT –**

This comprehensive review explores the intricate mechanisms and physiological implications of the circadian cycle. Delving into the molecular basis of circadian rhythms, it examines the role of clock genes and their regulation. The impact of circadian disruptions on health and disease is scrutinized, encompassing sleep disorders, metabolic

syndromes, and mental health. Additionally, the review surveys emerging research on circadian interventions, shedding light on potential therapeutic avenues. Through a synthesis of current literature, this abstract offers a nuanced understanding of the

circadian cycle's multifaceted influence on human biology and its relevance for healthcare strategies.

### **Introduction –**

The circadian cycle refers to a 24-hour rhythmic pattern that regulates various physiological processes in living organisms, influenced by external cues like light and temperature. Governed by internal "clocks," particularly clock genes, this cycle orchestrates daily fluctuations in activities such as sleep-wake patterns, hormone release, and body temperature. Disruptions to the circadian cycle, often seen in shift work or irregular sleep patterns, can impact health and contribute to conditions like insomnia and metabolic disorders. Understanding the circadian cycle is crucial for optimizing well-being and addressing associated health issues.

The Impact of the circadian cycle on human health takes center stage, as we examine its involvement in regulating sleep-wake patterns, hormonal secretion, and metabolic functions. Disruptions to the circadian rhythm, stemming from factors like shift work or irregular sleep schedules, are scrutinized for their implications on health, encompassing conditions such as insomnia, mood disorders, and metabolic syndromes.

In addition to understanding the circadian cycle's role in normal physiology, this review explores emerging research on circadian interventions. Investigations into the potential therapeutic applications of circadian-based strategies for improving sleep quality, managing metabolic disorders, and enhancing overall well-being are discussed.

Through a synthesis of current literature, this review aims to offer a nuanced perspective on the circadian cycle's multifaceted influence. By unraveling its complexities, we hope to contribute to a deeper understanding of how circadian rhythms shape human biology and provide insights into potential avenues for future research and clinical applications.

### **Effect of time of sleep on Circadian cycle –**

The timing of sleep plays a crucial role in regulating the circadian cycle, impacting various physiological and psychological processes. The circadian rhythm, governed by the body's internal clock, is intricately linked to the sleep-wake cycle. Optimal alignment between sleep timing and the circadian cycle promotes synchronization, contributing to overall well-being.

Sleep onset during the biological evening, when the body's core temperature decreases and melatonin secretion begins, enhances sleep quality and efficiency. Discrepancies, such as delayed or irregular sleep patterns, can disrupt the circadian rhythm, leading to potential health consequences. Shift work or nighttime exposure to artificial light may contribute to circadian misalignment, affecting sleep and contributing to conditions like insomnia or sleep disorders.

Research suggests that consistent sleep-wake schedules aligning with the natural circadian rhythm are associated with improved cognitive function, mood regulation, and metabolic health. Understanding the interplay between sleep timing and the circadian cycle is crucial for promoting optimal sleep hygiene and mitigating potential health risks associated with circadian disruptions.

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## **Methodology –**

### ***The functioning of circadian rhythm –***

Several genes control our circadian rhythms, which are in charge of essential functions such as changes in alertness, body temperature, metabolism, digestion, and hunger throughout the day. The circadian rhythm also regulates memory consolidation, with the formation of long-term memories occurring during sleep. It also influences the timing of hormone secretion, such as the hormones responsible for body growth predominantly working at night, as well as the body's healing process.

The circadian sleep phase usually happens at night, but it can occur at different times for different people. Some people are naturally early risers and go to bed early (morning larks), while others are night owls and stay up late and sleep in the morning. Besides influencing when they sleep, an individual's circadian rhythm can also impact their selection of emotional coping strategies, like assertiveness or rationalization, and their susceptibility to mental health disorders.

### ***The effect of your circadian rhythm on your mood –***

A disrupted circadian rhythm can impact a person's sleep and daily functioning, leading to various health issues like mood disorders such as depression, anxiety, bipolar disorder, and seasonal affective disorder.

A new study indicated that those who prefer staying up late may be more prone to mental health issues. The researchers discovered that individuals with different circadian rhythms tend to have different ways of coping with emotional stress, and those who are early risers appear to have better outcomes and experience fewer psychological issues as a result of their coping strategies. This study was correlational, so it did not explain the reasons for using different styles, but it highlights the significant influence that circadian rhythms have on health and functioning.

### ***Depression and the Circadian Rhythm-***

The majority of evidence about the connection between mood issues and circadian rhythm comes from research on shift workers, whose sleep schedules do not align with their natural body rhythms. According to several studies, there is a higher incidence of depression among workers who do night shifts. According to a meta-analysis, employees who work night shifts are 40% more likely to experience depression compared to those who work during the day. On the other hand, individuals with depression frequently experience disruptions in their circadian rhythms, resulting in alterations in their sleep patterns, hormone levels, and body temperature rhythms.

Depression symptoms may also follow a daily pattern, with some individuals experiencing more severe symptoms in the morning. The more out of sync a person's circadian and sleep cycles are, the more severe their depression is likely to be.

Numerous effective treatments for depression, such as bright light therapy, wake therapy, and interpersonal and social rhythm therapy, also have a direct impact on circadian rhythms. You can find more information on the influence of circadian rhythm on the development and management of depression associated with bipolar disorder in this blog post about light therapy for bipolar disorder.

### ***Seasonal affective disorder and circadian rhythm-***

During the winter months, individuals with seasonal affective disorder experience feelings of sadness and depression. Scientists think this is because of alterations in the body's internal clock caused by the changing length of daylight during different seasons.

Individuals suffering from seasonal affective disorder experience improvement in their condition when they utilize artificial morning light to synchronize their circadian rhythm with their sleep-wake cycle.

### ***How can I change my circadian rhythm-***

It is not possible to alter your circadian type as it is determined by genetics, although there may be some natural changes that occur over the course of your life. As an illustration, during adolescence, our natural sleep patterns typically shift to later in the day (more like owls), and as we get older, they tend to shift to earlier in the day (more like larks).

If you discover that your natural sleep pattern does not align with your preferred schedule, you can either adjust your social activities to fit your internal body clock, or attempt to adjust your internal body clock to match your social life. Shifting your work and social activities to align with your natural sleep-wake cycle could be a more manageable approach. For instance, someone with a delayed circadian rhythm who prefers to sleep and wake up later may find it beneficial to switch from a job with a 7 AM start time to a job that allows them to begin work around 10 AM. Another choice would be to

consult a sleep specialist and engage in continuous efforts to adjust your body's internal clock to align with your work and social schedule by waking up earlier.

Generally, the most effective way to boost your mood is to ensure you get a restful night's sleep that aligns with your natural sleep-wake pattern. Being exposed to light in the morning helps in synchronizing the body's internal clock. The exposure to intense light at night, such as bright artificial lighting and screen use on devices like laptops, tablets, and phones, can disturb our body's natural rhythm and potentially lead to a decline in mood and negative effects on our health.

### Observations-

*\*Note- Every Person required 9 point sleep.*

Sr. No.	Sleep Time	Sleep Point
1	After 2.5 hour of Sunset	2 points/ hour
2	After completing first part of 3 hours (upto 3 hours)	1 point/ hour
3	After completing second 3 hours part and before 1 hour of Sunrise	Half point/ hour
4	After completing Third part to mid-day	Less than Half point/ hour
5	After 2 hour of Mid-day ( upto 2 hours)	3 points/ hour
6	Before 2 hour of Sunset to starting of First part	No sleep

**Note- Sleeping at 6th sleep time responsible for headache or in some cases sleep disorder.**

### Result –

The investigation of effect of Mood, Sleep, Depression, Social Activities on Circadian Cycle was studied successfully.

### Conclusion and Discussion-

#### Ways to enhance your sleep and mood-

- 1) Get enough sleep at night. The majority of grown-ups require a minimum of seven to nine hours.
- 2) Rise and shine at the same time every day, including weekends. Waking up at the same time every morning helps to regulate when you fall asleep and can synchronize your body's internal clock with your sleep schedule.
- 3) **Reading and listening of Quran.**
- 4) Refrain from using screens or being in bright light for at least 60 to 90 minutes before going to bed. Consider activities such as reading in low light, listening to audiobooks, guided meditation or mindfulness discussions.

#### Compliance with Ethical Standards –

Not Applicable

#### References –

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