

# Influence of zeitgebers in circadian rhythm and health during COVID-19 infection.

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## Abstract

**The outbreak of COVID-19 caused a variety of emotional responses among the general public. Fear of infection, sense of isolation, financial crisis, stay-at-home policies, and uncertainty has influenced the well-being of all age groups. Policy makers should formulate measures to strengthen the psychological well-being of individuals.**

**Keywords:** Clock genes, Circadian misalignment, Quality of life.

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## Description

Protecting ourselves and others from COVID-19 infection is our responsibility. The precautionary measures advised by the health agencies like social distancing, wearing masks, washing hands frequently are to be rigorously followed. Life style changes associated during this pandemic such as work from home, home schooling of children, chronic exposure to blue light from television, mobile phone screens, irregular eating habits, lack of social interactions and physical activity may disturb the circadian rhythm. Thus, apart from adopting the precautionary measures, suitable life style modifications has to be taken to prevent circadian misalignment and associated complications.

Circadian rhythms are 24 h rhythmic phenomena that occur in all living organisms and govern almost all behavioural, physiological, biochemical, enzymatic and endocrine processes [1]. In mammals the clock system is organized in a hierarchical manner with a central pacemaker that is situated in the Suprachiasmatic Nucleus (SCN) of anterior hypothalamus and peripheral clocks located in other brain regions and in almost all peripheral tissues and organs, including pancreas, liver, skeletal muscle, kidney, adipose tissue, intestine and leucocytes. The external timing signals (zeitgebers) synchronise the internal clock network with external time. Circadian rhythms depend upon the zeitgebers to remain appropriately oriented to the individual's environment and desired routine.

Circadian misalignments between the different clocks are potentially detrimental to health. Work from home and home schooling of children both involves exposure of blue light for an extended period of time, an important zeitgeber that affects sleep. Apart from these, watching social media to update the news also make people anxious and distressed. These emotional states can disrupt circadian rhythms. Effective measures to minimise screen time exposure is essential, as too much blue light may disrupt the natural signals to sleep and studies have documented that sleep deprivation among children is associated with reduced alertness and poor performance. Thus policy makers should bring alterations in work/school timings schedules to prevent circadian misalignment.

The timing, quantity and the nature of food consumed has been changed during this pandemic. Mistimed eating, unbalanced diet may cause circadian desynchronization leading to metabolic disturbances. Immunity boosting kashayams are consumed in large quantities by all age groups during this period. In general, the ingredients, quantities, dosage are not correctly followed. As many of the common ingredients generate heat in the body, caution has to be exercised in consuming kashayams, as excess of anything is toxic.

Social interaction is a strong zeitgeber and low levels of this are linked to bipolar disorder. Disruption of family synchrony will bring emotional and behavioural changes [2]. Social distancing affects mental health and there are numerous data on increased suicidal death during this pandemic. Inabilities to deal with stresses, financial crisis, relationship break-up, sense of isolation are strongly associated with suicidal behavior [3]. Though social distancing is advocated to protect ourselves from COVID-19 infection, effective alternate ways to keep our mental health is of utmost importance.

Exercise regulates cardiovascular function, blood pressure, heart rate and hormonal function. By releasing endorphins, exercise enhances well-being by relieving stress, anxiety and tension. It is a powerful tool to overcome mental health problems. Exercise also promotes synchronisation of circadian rhythmicity and serves as a viable option for restoring dysregulated circadian rhythms.

## Conclusion

Circadian desynchrony may pose a serious health risk during this pandemic period and hence countermeasures to overcome them are necessary. Thus "Staying Safe and at the same time keeping our biological clock in synchrony" is the need of the hour.

## Declaration of Completing Interest

The author has no conflicts of interest to declare with reference to the above article.

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