

## Decline in Quality and Quantity of Sleep in Young Adults: The Need of the Hour

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### Dear Editor,

Sleep can be defined as a reversible state of unconsciousness associated with behavioral changes in the form of decreased body movements, inhibition or reduction in response to external stimuli, increased reaction time, elevated threshold for arousal and so on so forth. In short sleep is a dynamic and complex process during which some of our physiological body functions are increased while some decrease.<sup>1</sup> Sleep is defined as a physiological state of unconsciousness where some of the body functions are inhibited and some are activated.<sup>2</sup> Sleep mechanism is mysterious to the scientific community till date. Although we spend about one third of our life sleeping, but scientifically its potential benefits have not been explored to a more desirable extent, as we cannot concretely say till today, why exactly we are sleeping. Though we spent a significant amount of time in sleep, we are not scientifically sure why we are sleeping. However, sleep is absolutely essential for our survival. Our knowledge and experience all over the world have made one thing clear, sleep is necessary for survival; good sleep helps not only in the proper functioning of the brain but also enhances our abilities to adapt to changing environments, has been proved by various studies.<sup>3</sup> A ubiquitous knowledge & experience is there that good sleep is essential for proper brain functioning, as highlighted by several studies during the past years.<sup>4</sup> Sleep disturbance is emerging as a global health problem impacting about one third of the general population. Out of the total affected people, about 40%

report having serious impact.

Sleep deprivation or short sleep duration is the term coined for the people who are having  $\leq 6$  hours of sleep in 24 hours. Sleep disturbance is one of the most frequently encountered problems are widespread, affecting about 33% of the general population, of which about one in three reports serious problems. A person having sleep of 6 hours or less was defined as having short sleep duration or deprivation. The effects of sleep deprivation can be short term or long term. Continuous sleep deprivation leads to long term effects as a result of persistent activation of sympathetic system along with hypothalamo-pituitary-adrenal axis which subsequently increases the stress levels in our body. Some of the short-term effects include mood disorders, occurrence of somatic pain and deterioration of cognitive function which negatively impacts the academic performance (of students). Young adults having sleep deprivation frequently reported increased day time sleepiness which causes overall decline in their quality of life. Sleep deprivation has short-term and long-term effects. Long-term effects include constant activation of sympathetic system and hypothalamo-pituitary-adrenal axis that increases stress levels. Also, there will be alteration in the circadian rhythm that disrupts the functioning of all body systems. A short-term effect includes mood disorders, somatic pain and decline in cognitive functions that decrease their academic performance.<sup>2</sup> Day time sleepiness was reported by most young adults as a consequence of sleep deprivation. There will be overall decline in the quality

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of life of these young adults.

The most frequent causes attribute to sleep deprivation are either physiological or behavioral. One of the commonest causes of physiological sleep deprivation is study which is typical for students choosing the field of medicine to become future medical professionals. To increase their study by compromising their sleeping time. And to keep themselves awake they use various tactics like increased consumption of tea or coffee, which not only postpones sleep but also causes increase in sleep latency. Additionally, some students have resorted to use of pharmacological agents to keep themselves awake longer. Also, there are reports of enhanced substance abuse in recent times like cocaine, alcohol etc. which act as stimulants. These stimulants not only delay sleep but also cause decline in sleep quality, especially the rapid eye movements sleep. Last but not least, to add up to the list of reasons causing sleep deprivation is excessive usage of modern technology. As per the National Sleep Foundation's 2006 Sleep in America poll, almost all adolescents had at least 1 media electronic device out of televisions (57%), music players (90%), video game consoles (43%), computers (28%), and phones (64%) in their sleeping room.<sup>5</sup> Many studies on adolescents have demonstrated sleep disruption due to exposure to electronic devices in the evening. It is assumed that the light emitted by the electronic devices disrupts circadian rhythms by suppressing melatonin secretion, increasing the time to fall asleep at a definite time after lying down comfortably on the bed. The common causes for sleep deprivation can be physiological or behavioral. Physiological causes include postponement of sleep due to studies. This is very true in the case of students in medical profession. To postpone sleep, they practice consumption of coffee or tea which not only postpones sleep but also increases sleep latency. Another method the students usually follow is using pharmacological agents to delay sleep. Further, it was reported that stimulant use also increased in the student population in recent years, including alcohol, cocaine, etc. These stimulants not only delay sleep but also decline sleep quality, especially rapid eye movements. Another major cause for sleep deprivation is excessive usage of technology, such as a smart phone or computers. According to the National Sleep Foundation's 2006 Sleep in America Poll, almost all adolescents had at least 1 media electronic device in their bedroom.<sup>5</sup> Among the devices reported were televisions (57%), music players (90%), video game consoles (43%), computers (28%), and phones (64%). The teenagers engaged simultaneously in an average of 4 electronic activities after 9:00 PM. It

is not surprising that several adolescent studies have demonstrated that electronic exposure in the evening potentially disrupts sleep. The possible mechanism for the detrimental effect of electronics use on sleep is that the light produced by electronic devices may disrupt circadian rhythms by suppressing melatonin, resulting in the inability to fall asleep reasonably. In the current lifestyle, there may be no individual who does not own a smartphone. In the present world, we cannot imagine our life without a smartphone in most of the urban and many rural areas. Thus, surprisingly, we can find children at 2 years of age listening to music using smartphone. And the children, as they grow up, continue this excessive use of modern gadgets, and thus their sleep get compromised and the effects of sleep deprivation start showing. Children and adolescents have become too engaged in activities like playing videogames with PUBG as one example. The regular use of social media platforms like Facebook, WhatsApp has shifted the time for going to bed post-midnight in many such individuals. With the continuation of late sleeping habits, there occur readjustments of various biological rhythms in our body and one such is circadian rhythm, which is highly disastrous for homeostasis. It has been found that there has been a drastic decrease in the duration of sleep for adults from 7.5 hours in 2017 to 6 hours in 2021.<sup>3</sup> The shifting of school timings to early hours has not only decreased the sleep time which has affected the quality of sleep, sleep-wake schedule, daytime behavior but also as an alarm sign is causing delay in pubertal phase. Modern day lifestyle in the form of late-night or shift jobs or activities or jobs, early morning school requirements and pubertal delay can greatly decrease hours available to sleep for our surprise, children starting using a smartphone for listening songs at the age of two. This habit continues when they grow and excessive use can be detrimental to the sleep. It can be playing video games like PUBG etc. or using the social media apps like WhatsApp, Facebook etc. due to these practices, these individuals go to bed at about 2 or 3 in the night. When this habit continues, there will be re-adjustment of their circadian rhythm and such a change is highly dangerous for homeostasis. Sleep duration was drastically decreased in young adults from 7.5 hours to 6 hours from 2017 to 2021.<sup>3</sup> Further, transition to an earlier school start time, along with pubertal phase delay, significantly affect the quality of sleep, sleep-wake schedule, and daytime behavior. The combination of the phase delay, late-night activities or jobs, and early morning school demands can significantly constrict hours available to sleep.

Young participants are emotionally more affected by sleep deprivation than older adults, especially regarding negative aspects of mood. This could be related to the well-known positivity effect in older age. A number of recent studies have focused on the possible relationship between sleep and suicidal ideation. Compared with pre-COVID-19 baseline young people reported longer sleep duration, later sleep phase, increased sleep latency and worse executive function during pandemic.<sup>6</sup> Thus, sufficient sleep represents a resilience factor against executive function decline during unprecedented crisis. Hence, it is the need of time to consider and give high priority to the decline in sleep quality and quantity in young adults. The primary responsibility of parents and teachers is to educate young adults about the consequences of sleep deprivation. Periodic assessment of sleep patterns is much needed in young adults to diagnose the sleep disorders at early phase. Further, as

recommended in literature, they should be counseled with management strategies to improve their sleep quality and quantity.

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