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Sleep and Human Health

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INTRODUCTION

Sleep is essential ,not only for the effective daily functioning of individuals but ,also for the optimal mental and physical health of the society at large [1]. The National Sleep Foundation, USA recommend 7-9 hours of sleep for an adult to remain healthy [2]. Scientific studies have highlighted the importance of not only the number of hours of sleep but also the quality of sleep . This article is a review of evidence regarding importance of sleep and how good sleep etiquettes and habits , can promise good quality sleep leading to health and well being .

Sleep and human health

Up to a third of fatal motor vehicle accidents are thought to involve sleepy drivers. Sleep-deprived individuals can not only adversely impact their organizational performance but also become an economic burden on healthcare systems due to the multiple sicknesses that follow. [3].Excessive daytime sleepiness (EDS) is associated with high body mass index (BMI), diabetes mellitus, depression, and reduced quality of life· [4]. By age 27, individuals with short sleep duration (less than 6 hours) were 7.5 times more likely to have a higher body mass index, after controlling for confounding factors such as family history, levels of physical activity, and demographic factors [5].

Sleep insufficiency was associated with lower levels of leptin, a hormone produced by an adipose tissue to suppresses appetite, and higher levels of ghrelin, a peptide that stimulates appetite [6]. Thus, a vicious cycle is created by sleep deficiency with high BMI, result in increased morbidity of the individual even without other compounding factors.

In the Sleep Heart Health Study, adults (middle-aged and older) who reported 5 hours of sleep or less were 2.5 times more likely to have diabetes, compared with those who slept 7 to 8 hours per night [7]. Restless leg syndrome is yet another troublesome manifestation of poor-quality sleep.

According to large epidemiological studies sleep deprivation is associated with a risk of myocardial infarction and perhaps stroke [8]. Potential mechanisms explaining the link could be increase in blood pressure and sympathetic hyperactivity resulting from poor sleep.

As per Hasler et al, adults with chronic sleep loss have been noted to report excess mental distress, depressive symptoms, anxiety, and alcohol use. Partial sleep deprivation can alter mood to an even greater extent than cognitive or motor functions [9].

What impacts sleep today

Circadian rhythm is a finely tuned 24-hour cycle that signals the human body to carry out essential functions. Light is one of the most important factor influencing circadian rhythm. Throughout history, this rhythm has been aligned to sunrise and sunset as that was the major source of lighting. In older days, people spent their evenings in (relative) darkness. The present world sees illuminated evenings, exposing the human eyes to a lot of artificial light. Definitely this has its adverse consequences.

With increasing efforts to fight global warming and climate change, the use of energy efficient light bulbs (i.e. fluorescent, compact fluorescent, LED) is being promoted by the governments. While the energy crisis might benefit, what is overlooked, is that they emit much more blue light than yellow light bulbs. Blue light is that part of the visible light, which can directly affect the back part of the eye causing permanent degeneration. Additionally, it also can suppress release of melatonin, delaying and disrupting sleep onset.

Globally, the culture of 24 hour connectivity is leading to lifestyle change. Most human interactions have become web-based, particularly after the COVID pandemic when communication is largely web-based. Improved connectivity world-wide has not come without its ill-effects. Digitalization of various fields have increased screen times to human eyes leading to increased exposure to high energy blue and violet light, resulting in adverse visual and cognitive effects, with last but not the least, sleep disturbances. Exposure to artificial light (particularly blue light) after dark disturbs the body clock.

Bedrooms today have become media rich containing many electronic devices. Smart phones due to the ubiquity, portability and connectivity, stay with the user till bedtime, ensuring prolonged exposure. Not only does this lead to reduced sleep time but also negatively impacts sleep quality duration and could worsen the physical and cognitive performance the next day [10].

In their study, AlShareeef established that smartphone and tablet use conferred a 1.5-to-2-fold risk of longer sleep latency (>30 minutes) [11].

Since Burkhart and Phelps (2009) found a decrease in sleep quality after 3 h of blue light exposure, it might be recommended to restrict the usage of blue light emitting devices 3 h before bedtime [12].

Sleep and teen health

Sleepiness is a term used for the feeling when one wants or needs to sleep in places and at times when one should not be asleep. An article in Paediatrics and Child health states that upto 40% of teens are unusually sleepy most of the times, feeling they do not get enough sleep [13]. Scientific evidence clearly states that teenage is a period of rapid growth and development making teens need between 9 hours and 10 hours of sleep, to function their best. Surprisingly this is more than what they needed as children or will need as adults.

It has been demonstrated in scientific evidence that adolescents have a biological delay in the timing of sleep onset, which can result in them staying awake later. This is more often with older adolescents. The reason for this is a change in the two processes that are involved in sleep regulation: the intrinsic circadian timing system and the homeostatic sleep-wake system [13]. A reduced urge to fall asleep results in adolescents staying awake later; hence, they have an overall shortened sleep duration.

There are some specific sleep disorders that affect adolescents and young adults (defined as people between age group 10 to 24 years). Delayed sleep phase syndrome, is the most common disorder, being prevalent in up to 7% of adolescents, and may continue into young adulthood. Defined as a pathological shift of the normal delay in the timing of sleep onset, it can result in the affected. typically getting sleep between 1am and 4am and waking up much later in the morning [14]. Significant sleep deprivation follows if the individual's daily routines do not allow for a late awakening. Sleep deprivation or late awakening may have negative impacts on the productivity and performance of adolescents with resulting disturbances in coping, mood ending in depression.

Access to social media and especially a cell phone in teenagers' bedrooms is associated with a reduction in sleep time, during the school week with negative effects on daily functioning and mood. Promoting awareness among teenagers about the use of social media and sleep needs to start early (before 11 years), and parent controlled bedtimes has been shown to increase teenage sleep time [15].

Studies undertaken in American 14–18-year-olds have found insufficient sleep to be associated with an increased likelihood of engaging in some health-risk behaviors, such as smoking, alcohol use, marijuana use and violence. In a Finnish study of 13–18-year-olds, 27% reported weekly sleep problems, which in turn were associated with older individuals as well as peer and alcohol problems. Sleep deprivation affects cognition, and resulting poor choices and peer pressure may lead to these behaviors 1[16].

Blue Light blocking lenses and glasses-What does evidence recommend?

Blue blocking spectacle lenses that are claimed to be attenuating short Wavelength light are being marked by many companies, not only to reduce eye strain and resulting discomfort when using digital devices, but also to improve

sleep quality. Laurence et al found no available high-quality evidence to support Blue blocking spectacles except mild improvement in sleep quality [17]. Singh et al also found no evidence from RCT publications relating to the outcomes of contrast sensitivity, colour discrimination, discomfort glare, macular health, serum melatonin levels, or overall patient visual satisfaction with the use of such lenses and recommend high-quality randomized trials to study the effect of such glasses on sleep in humans [18].

Sleep etiquettes

With a world dependent on the internet and gadgets, it is imperative to highlight some habits that can help get good quality and quantity of sleep, for long term physical and mental well-bring. The trio of good health is undoubtedly good nutritious diet, good exercise and good sleep. Simple steps at encouraging one and all to follow these can ensure good health.

- Always fall asleep in your bed, and not in front of the television. At bedtime, your room should be cool, dark and quiet.
- Try to go to bed at about the same time every night.
- Use your bed for sleeping only. Do not do homework, watch television or spend time talking on the phone while in your bed.
- Avoid very hard exercise in the evening.
- Set an alarm that reminds you to turn off electronics two to three hours before bedtime.
- Use bulbs emitting red or orange light rather than blue if you like to read till bedtime.
- Use gadgets in Night mode to reduce emission of blue light. If there are light sources in your bedroom that you are unable to dim or turn off, try using an eye mask to block them out once you are in bed.

CONCLUSION

Sleep and sleepiness have widespread impacts on public health and economy at large. E Joseph Cossman, an Entrepreneur once said," The best bridge between despair and hope is a good night's sleep. A good night's sleep does wonders to one's mental and physical wellness on any given day, improving our efficiency, be it a student in class, exam or a professional at work.

The worldwide burden of sleep-related dysfunction is increasing, which given its impact on health, waking function, short and long-term wellbeing of people, is a public health priority. Many research articles have been published also to generate scientific evidence too. Healthcare providers meet regularly to discuss, evaluate and distribute information about circadian rhythm and sleep disorders.

Sleep hygiene advice must be disseminated with greater enthusiasm, including information on electronic device use to mitigate their negative effects on sleep and empower better human workforce. Improving awareness on sleep quality and duration can limit onset of other bigger problems, and is the need of the hour, particularly for adolescents and young adults.

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