



**SLEEP - EMPOWERING PEOPLE**

**S. Arshiya Banu<sup>\*1</sup>, S. Asadulla<sup>2</sup> and K. Purushothama Reddy<sup>3</sup>**

<sup>1</sup>Pharm.D (PB), Department of Pharmacy Practice, P. Rami Reddy Memorial College of Pharmacy, Kadapa A.P – 516003.

General Secretary -Women's Wing, Kadapa District Tourism Development Association - Kadapa district.

<sup>2</sup>M.Pharm, Pharmacist-Dubai Health Authority, Dubai.

<sup>3</sup>Assistant Professor, Department of Pharmacy Practice, P. Rami Reddy Memorial College of Pharmacy, Kadapa, A.P – 516003.

**\*Corresponding Author: S. Arshiya Banu**

Pharm.D (PB), Department of Pharmacy Practice, P. Rami Reddy Memorial College of Pharmacy, Kadapa A.P – 516003.

Article Received on 26/03/2016

Article Revised on 16/04/2016

Article Accepted on 06/05/2016

**ABSTRACT**

Sleep plays a vital role in our daily life. Physiologically, it is a complex process of restoration and renewal for the body. Sleep is involved in healing and repair of our heart and blood vessels and it plays a major role in improving the physical health. This article focuses on the importance of sleep and also on the facts, how people is becoming far from adequate sleep and suffering from sleep problems as well as many other health related problems like heart diseases, stroke, obesity, epilepsy, kidney diseases and psychological disorders. It also focuses on aspects like how sleep helps in wound healing, remembering, learning immune functioning and restoration. This article supports the viewers to know the major affects caused due to inadequate sleep and the routine things that most of the youth do to be awake to indulge in other activities which unknowingly leads them to suffer from many health related problems.

**KEYWORDS:** Sleep, health, sleep deprivation, heath problems.

**INTRODUCION**

Sleep is a naturally recurring state of mind which is characterized by altered consciousness, relatively inhibited sensory activity, inhibition of nearly all voluntary muscles, and reduced interactions with surroundings.<sup>[1]</sup> It plays an important role in our daily life and it is clear that sleep is essential for not only humans but also for animals. Like humans all animals need sleep along with food, water and oxygen to survive. Scientists still do not have a definitive explanation for why humans have a need for sleep.

According to psychologist and sleep expert David F. Dinges, Ph.D., of the Division of Sleep and Chronobiology and Department of Psychiatry at the University of Pennsylvania School of Medicine, irritability, moodiness and disinhibition are some of the first signs a person experiences from lack of sleep. Sleep is believed to be important in many physiologic processes and for well being. We spend one third of our lives asleep, and the overall state of our "sleep health" remains a question throughout our life span.

**IMPORTANCE OF SLEEP**

Sleep is essential for a person's health and wellbeing, according to the National Sleep Foundation (NSF).

- It is a fact that sleep is food for brain because during sleep, important body functions and brain activity occur.
- A person experiencing sleep becomes very active. A research showed that our brain becomes very active during sleep as the brain uses the sleep to strengthen existing as well as building new pathways. These new pathways in the brain helps us with both concentration and reaction time.
- During sleep brain refresh itself which helps our ability to learn and remember.
- Sleep has a crucial effect on mood. People who don't get adequate sleep have a greater risk of depression.
- Lack of sleep slows down the reaction time as the brain slows down our thinking process all together, leading to confusion an even increases our chances of engaging in risky behaviors.
- Sleep deprivation leads to many health related problems like obesity, epilepsy, heart problems and psychological disorders. It also reduces the immune functioning<sup>[2]</sup> and leads to lack of concentration, impatience, sleep apnea and many more.

**ROLE OF SLEEP IN DAILY LIFE**

Sleep plays a vital role in good health and well-being throughout the life. Getting enough quality sleep at the right times can help protect your mental health, physical

health, quality of life, and safety. The following are some of the roles of sleep in our daily life.

### Role of Sleep in Learning and Memory

A hypothesis says that sleep periods are favorable for brain plasticity and, in the adult brain, for learning and memory. A research in sleep and memory began in earnest after the discovery of REM in 1953.<sup>[3]</sup> Since then, a wide range of studies on REM have supported the hypothesis that REM plays a critical role in learning.<sup>[4-7]</sup> Besides this REM may also enhance the processing of emotional memories. There is an enhanced recall for emotionally salient memories after periods of sleep rich in REM (Rapid eye movement sleep)<sup>[8]</sup>, and several studies similarly support a role for REM in processing emotional memories.<sup>[9-13]</sup>

Hennevin *et al.* investigated the ability of the brain to encode and consolidate memories during REM occurs through direct brain stimulation.<sup>[14]</sup> Their results indicate that both the consolidation of learning and the formation of new associations can be mediated by pontine reticular formation (PRF) activation during sleep. In addition to that a correlation between an increased density of PRF-generated PGO waves during posttraining REM and subsequent improved task performance has been reported<sup>[15]</sup>, suggesting that PGO waves facilitate learning in the rat.

### Role of sleep in decision making

In the August 2004, Dr. Timothy Roehrs, the Director of research at the Sleep Disorders and Research Center at Henry Ford Hospital in Detroit published one of the first studies to measure the effect of sleepiness on decision making and risk taking and he found that sleepiness does take a toll on effective decision making. Through this we can know that how important sleep is in our regular life.

### Role of sleep in heart problems

Sleep plays an important role in our physical health as it involved in healing and repair of your heart and blood vessels. Ongoing studies shows that sleep deficiency is linked to an increased risk of heart disease, kidney disease, high blood pressure, diabetes, and stroke. Some researchers suggested that short sleepers, typically defined as people who get less than six hours of sleep a night, as well as people who don't spend enough time in the deepest stages of sleep, are at higher risk of heart attacks and strokes than those who get at least seven hours. A 2011 study in male Japanese factory workers found those who slept less than six hours a night had a five-fold increased heart attack risk over a 14-year span compared with those who logged between 7 and 8 hours a night. Another study published in 2011 found that healthy men 65 and older with normal blood pressure were nearly twice as likely to develop hypertension during the study if they spent less time in the deepest sleep stage (known as slow-wave sleep) compared with those who spent the most time deeply asleep. Another report published in 2012 says, Swedish researchers

reported that hospital admissions for heart attacks increased by about 4% in the week after the spring transition to time compared to other weeks. As this occurs when we "spring forward" and set our clocks an hour ahead—meaning many of us lose an hour of sleep. Although it is not clear why sleep may affect the heart, or if there is some unidentified factor that affects your cardiovascular system and ability to sleep. But one nighttime problem is a known heart hazard—sleep apnea. People those who have sleep apnea tend to snore and have upper airway collapse during sleep. Further, this causes them to snort and gasp for breath, without really waking up enough to be aware of it. In fact, many experts think sleep apnea may account for one-third of all cases of high blood pressure among adults. It was estimated that people who get less than six hours of sleep a night are prone to three major health problems, which are heart disease, diabetes, and stroke. Remember, that adults need between seven and nine hours of sleep each night for optimal health. Not only adults are at risk for health problems by not getting enough sleep. Adolescents face risks as well, including high cholesterol and elevated blood pressure in case of sleep deprivation.

### Role of sleep in children

In infants by the time when they reach the age of two their brain size has reached 90% of an adult sized brain.<sup>[16]</sup> Majority of the brain growth has occurred during the period of life with the highest rate of sleep and the hours of sleep influence their ability to perform on cognitive tasks.<sup>[17,18]</sup> Children those who have less waking episodes during sleep have higher cognitive attainments and easier temperaments than other children.<sup>[19,20]</sup> Sleep also influences language development. Researchers taught infants a faux language and observed their recollection of the rules for that language.<sup>[21]</sup> Results showed that Infants who slept within four hours of learning the language could remember the language rules better, than those who stayed awake longer did not recall those rules as well. Some researchers said that infants who sleep longer at night at 12 months have better vocabularies at 26 months.<sup>[20]</sup>

### FACTS OF SLEEP

- ✚ A research shows that lack of sleep affects mood, and a depressed mood can lead to many complications.
- ✚ To combat this vicious cycle, sleep experts recommend that teens prioritize sleep and focus on healthy sleep habits.
- ✚ Teens should take 8 to 10 hours of sleep to function best.
- ✚ Teens tend to have irregular sleep patterns across the week as they typically stay up late and sleep in late on the weekends, which can affect their biological clocks and hurt the quality of their sleep.
- ✚ Many teens suffer from treatable sleep disorders, such as narcolepsy, insomnia, restless legs

syndrome or sleep apnea if they won't get enough sleep.

- ✚ People suffering from lack of sleep limit their ability to learn, listen, concentrate and solve problems. They may even forget important information like names, numbers, their homework or a date with a special person in your life.
- ✚ Lack of sleep make you more prone to pimples and can contribute to acne and other skin problems.
- ✚ Sleep deprivation leads to aggressive or inappropriate behavior such as yelling at your friends or being impatient with your teachers or family members.
- ✚ It can cause you to eat too much or eat unhealthy foods like sweets and fried foods that lead to weight gain which is one of the major problem in day to day life.
- ✚ It can heighten the effects of alcohol and possibly increase use of caffeine and nicotine and contribute to illness, not using equipment safely or driving drowsy.
- ✚ Skipping sleep can be harmful and even deadly, as sleepiness make you to look bad, you may feel moody, and you perform poorly. It can make it hard to get along with your family and friends and hurt your scores on school exams, on the court or on the field
- ✚ A brain that is hungry for sleep make disaster even when you don't expect it. For example, falling asleep, sleep deprivation and drowsiness at the wheel cause more than 100,000 car crashes every year.

#### TAKE ACTION

'Lack of sleep' is becoming another reason for obesity. A research indicated that short sleep as well as obesity are surrogates for lifestyle, psychological, socioeconomic and waking pressures.

The persons who have <7 h sleep (especially habitual 6–7 h sleep) is associated with increased obesity are mostly based on two factors: (i) Generalizations from 5 h sleepers and/or when the subdivisions of sleep duration are unclear and (ii) Laboratory settings of acute, atypical (4 h) sleep restrictions on healthy young adults of normal weight, i.e. conditions that are ostensibly stressful and certainly involve excessive sleepiness. Sleep is intimately involved in the regulation of energy balance, to ensure normal body weight, the extent that these underlying mechanisms might have gone awry in some obese, short sleepers is unknown. Yet, others still advocate<sup>[22]</sup>, 'that chronic partial sleep loss may increase the risk of obesity and weight gain, and these sleep restriction results in metabolic and endocrine alterations. Altogether, the evidence points to a possible role of decreased sleep duration in the current epidemic of obesity. Bedtime extension in short sleepers should be explored as a novel behavioral intervention that may prevent weight gain or facilitate weight loss. Thus, obese persons rather than doing diet or insufficient exercise,

have to take more sleep as it indeed a worthwhile therapeutic solution. Recent research also suggests that a lack of sleep could be contributing to problems like diabetes and weight gain, both are serious health hazards. In case of diabetes, sleep deprivation reduces sensitivity to insulin, the key blood-sugar-regulating hormone, while making it harder metabolize blood sugar properly. However in case of obesity, Short sleep boosts levels of hormones that make us hungry, while reducing secretion of the hormones that help us feel full. So it makes sense that being starved for sleep could lead to weight gain and the fact is that being awake longer gives us more time to eat.

#### SLEEP CONNECTION

Sleep is not only connected with our physical health but also linked with our mental health. Now a day's many sleep disorders are arising due to lack of sleep in that one of the most common sleep disorders is insomnia. One has insomnia when they have difficulty falling asleep, staying asleep, or waking up too early. People suffering from insomnia will also feel un refreshed the day after sleeping badly. Other symptoms of insomnia include, fatigue or low energy, difficulty concentrating, changes in mood, like irritability, changes in behavior, including impulsive or aggressive behavior, and difficulty in work, school, or relationships. Researches showed that there's a real connection between sleeping problems and depression. Because sleep and depression are highly linked, it is extremely important that you get a good night's sleep every night without fail. As we know that sleep deficiency also increases the risk of obesity. For example, one study on teenagers showed that with each hour of sleep lost, the odds of becoming obese went up. Sleep deficiency increases the risk of obesity not only in teenagers but also in other age groups as well. One of the most important factor of sleep is it helps as to maintain a healthy balance of the hormones that make us feel hungry (ghrelin) or full (leptin). When a person don't get enough sleep, his level of ghrelin goes up and your level of leptin goes down. This makes him feel hungrier than when he is well-rested.

Sleep also has a connection with insulin, the hormone that controls your blood glucose (sugar) level. Sleep deficiency results in a higher than normal blood sugar level, which may increase your risk for diabetes. So it's better to take a healthy sleep. Sleep also supports healthy growth and development. Deep sleep triggers the body to release the hormone that promotes normal growth in children and teens. These hormones also boost muscle mass and helps repair cells and tissues in children, teens, and adults. By this sleep also plays a role in puberty and fertility. Sleep has major role in maintaining immune system, immune system relies on sleep to stay healthy. This system defends in our body against foreign or harmful substances. Ongoing sleep deficiency can change the way of immune system and that person may experiences trouble in fighting common infections. Sleep deprivation has a significant impact on quality of life and

poor sleep quality is related to a variety of diseases<sup>[23]</sup>, has a significant impact on total health care costs, and is a major cause of work absenteeism.<sup>[24]</sup> Ongoing sleep deficiency can raise your risk for some chronic health problems. It also can affect how well you think, react, work, learn, and get along with others.

#### Other recent studies outline the adverse effects of poor sleep among students

- Sleepiness and poor sleep quality are prevalent among university students as they are becoming far from sleep further affecting their academic performance and daytime functioning.
- Students with symptoms of sleep disorders are more likely to receive poor grades in classes such as math, reading and writing than peers those without symptoms of sleep disorders.
- College students with insomnia have significantly more mental health problems than those without having insomnia.
- College students with medical-related majors are more likely to have poorer quality of sleep in comparison to those with a humanities major.
- College students who pull "all-nighters" are more likely to have a lower Grade point average.

Finally, most research studies says that don't make your Face book page, BlackBerry, or TV as your final destination of the evening. Using these devices for communication is clearly eating into our sleep time. Dr. Somers says, " Those people who are spending more time being connected than sleeping," texting friends, playing computer games, or just watching TV stimulates their brains and bodies at a time when they should be winding down, and the extra light they expose on themselves to when they peer at a screen could be throwing off their body clocks. This is because when it gets dark, our bodies release a hormone called melatonin that helps make us sleepy, and pre-bedtime bright light exposure especially exposure to the blue light emitted by screens large and small weakens melatonin release. Thus, good night sleep is very essential. Have and adhere to a regular bedtime sleep and waking schedule and maintain a comfortable sleep environment, including a comfortable temperature.

#### CONCLUSION

Sleep is food for the brain. Sleep and a well-functioning balanced immune system are both essential to maintain a normal health physical status and mental status. Sleep controls metabolism and weight and lack of sleep can cause many health problems. Adequate sleep boosts the mood and improve safety when performing daily tasks. Besides, sound sleep promotes hormonal balance and supports healthy brain function. In children and teens, sleep also helps support growth and development and boosts the immune system. Don't forget to add sleep to your list of health priorities. As we sleep, our heart rate and blood pressure both lower a bit. Sleep could be key to keeping our hearts (and bodies) healthy and in reducing heart problems and stress too. Avoid watching

television or using electronics with backlit screens in bed and falling asleep with the TV on in the room as this blue light weakens melatonin release. Sleep is essential for good health in both the body and the mind. Take time and adhere to sound sleep as it makes you more healthier than ever.

#### REFERENCES

1. Macmillan Dictionary for students Macmillan, Pan Ltd, 1981; 936. Retrieved 1 October 2009.
2. D. Lorton, C. L. Lubahn, C. Estus et al., "Bidirectional communication between the brain and the immune system: implications for physiological sleep and disorders with disrupted sleep," *NeuroImmuno Modulation*, 2006; 13(5-6): 357–374. View at Publisher · View at Google Scholar · View at Scopus.
3. E. Aserinsky, N. Kleitman, *Science*, 1953; 118: 361.
4. C. Smith, *Neurosci. Biobehav. Rev.*, 1985; 9: 157.
5. L. Lapp, *Sleep Res.*, 1987; 16: 211.
6. C. Smith, *Behav. Brain Res.*, 1995; 69: 137.
7. G. M. Rose, *Physiol. Behav.* 59, 93 (1996).
8. U. Wagner, S. Gais, J. Born, *Learn. Mem.*, 2001; 8: 112.
9. M. H. McGrath, D. B. Cohen, *Psychiatr. Bull.* 1978; 85: 24.
10. C. Grieser, R. Greenberg, R. H. Harrison, *J. Abnorm. Psychol.*, 1972; 80: 280.
11. R. D. Cartwright et al., *Psychophysiology*, 1975; 12: 561.
12. R. Greenberg, R. Pillard, C. Pearlman, *Psychosom. Med.*, 1972; 34: 257.
13. I. Lewin, D. Gombosh, in *Sleep: Physiology, Biochemistry, Psychology, Pharmacology, Clinical Implications*, W. P. Koella, P. Levin, Eds. (Karger, Basel, Switzerland, 1973: 399D403.
14. E. Hennevin, B. Hars, C. Maho, V. Bloch, *Behav. Brain Res*, 1995; 69: 125.
15. S. Datta, *J. Neurosci*, 2000; 20: 8607.
16. Dahl RE. "The regulation of sleep and arousal: Development and psychopathology". *Development and Psychopathology*, 2009; 8(01): 3–27. doi:10.1017/S0954579400006945.
17. Jenni OG, Dahl RE. "Sleep, cognition, and neuron, and emotion: A developmental review.". In Nelson CA, Luciana M. *Handbook of developmental cognitive neuroscience* (2nd ed.). Cambridge, Mass.: MIT Press, 2008; 807–817. ISBN 0262141043.
18. Scher A. "Infant sleep at 10 months of age as a window to cognitive development". *Early Human Development*, 2005; 81(3): 289–92. doi:10.1016/j.earlhumdev.2004.07.005. PMID 15814211.
19. Spruyt K, Aitken RJ, So K, Charlton M, Adamson TM, Horne RS. "Relationship between sleep/wake patterns, temperament and overall development in term infants over the first year of life". *Early Human Development*, 2008; 84(5): 289–96.

doi:10.1016/j.earlhumdev.2007.07.002. PMID 17707119.

20. Bernier A, Carlson SM, Bordeleau S, Carrier J. "Relations between physiological and cognitive regulatory systems: infant sleep regulation and subsequent executive functioning". *Child Development*, 2010; 81(6): 1739–52. doi:10.1111/j.1467-8624.2010.01507.x. PMID 21077861.
21. Hupbach A, Gomez RL, Bootzin RR, Nadel L. "Nap-dependent learning in infants". *Developmental Science*, 2009; 12(6): 1007-12. doi:10.1111/j.1467-7687.2009.00837.x. PMID 19840054
22. Leproult R, Van Cauter E. Role of sleep and sleep loss in hormonal release and metabolism. *Endocr Dev*, 2010; 17: 11–21.
23. J. C. Verster, S. R. Pandi-Perumal, and D. L. Streiner, Eds., *Sleep and Quality of Life in Clinical Medicine*, Humana Press, New Jersey, NJ, USA, 2008. View at Publisher · View at Google Scholar
24. A. P. Smith, "Twenty-five years of research on the behavioural malaise associated with influenza and the common cold," *Psychoneuroendocrinology*, 2013; 38(6): 744–751. View at Publisher. View at Google Scholar. View at Scopus.