

Healthy Living and Sleep

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Abstract—With the changing lifestyle, people are becoming less concerned about their health and don't take proper sleep. Now a days' work has dominated the sleep wake cycle of a man. Sleep is natural phenomenon of being relaxed wherein our neurological function is slowed down and our interaction with the environment is minimized however it does not mean that we are inactive, some of our metabolic function are still active. Sleep refreshes our brain which enables us to work more effectively and efficiently. Different organisms have different sleeping patterns and differ in their sleep duration. A hormone called melatonin also known as "Dracula of all hormones" is released during night, plays a major role in sleep wake cycle. People belonging to different age group need different amount of sleep per day such as infant need 12- 15 hour of sleep per day in contrast the adult needs just 7-8 hour of sleep per day. There are two phases of sleep rapid eye movement and non rapid eye movement which will be discussed in detailed later in the article. But for assuring a healthy life its necessary to take appropriate sleep as it affect our physical and mental health. Sufficient sleep provides good memory and lowers the risk of certain diseases. Common sleep disorders are insomnia narcolepsy, hypersomnia and sleep apnea. We will further discuss the benefits of sleep, factors affecting sleep and sleep related disorders in detail.

1. INTRODUCTION

Health and sleep are companions of daily life. The term health means being physically mentally and socially healthy and sleep is a natural state of being relaxed where in our muscles and our neurological functions are slowed down. We minimize our interaction with the surrounding during sleep. For a healthy life besides nutritious food and exercise we need appropriate amount of sleep. Sometimes sleep is misinterpreted with a state of being totally inactive while it's not true. There are some metabolic functions and some parts of brain which are more active during sleep. Sleeping patterns differs in various organism. They are called diurnal which are active during the day and sleep at night. Others are called nocturnal if they active during night and sleep during the day. Ahead we will be talking about how sleep affect our health? What are the phases of sleep? How much sleep a person need? Which is the hormone controlling sleep? Factors interfering sleep with respect to our daily habits? Benefits of sleep and some interesting facts and things we see around us but never paid attention on them.

Sleep has a great impact on our vital physiological and mental health. During sleep our anabolic function are heightened. The circadian rhythm (CR) are physical, mental, and behavioral change that follows a roughly 24 hour cycle responding to light and darkness in the surrounding of an organism. The study of circadian rhythm is called chronobiology. CR are endogenous in nature and can be adjusted or entrained to local environmental stimuli called as zeitgebers.

Brain has a group of nerve cells called super chiasmatic nucleus (SCN) located in hypothalamus and controls the production of melatonin. Melatonin is a very important player in the sleep wake cycle. It is hormone which is produced by an endocrine gland called pineal gland which is located in epithalamus (the dorsal segment of diencephalon which is the part of fore brain). During the day the pineal is in inactive state and do not release melatonin while as the sun goes down the pineal become active and start releasing the hormone and as time passes its concentration goes on increasing. We then feel lethargic and unable to concentrate on our work. Melatonin is also known as the "Dracula of all hormones" as its secretion takes place only at night. Its concentration remain high up to 12 hours and as the sun rises it decreases. Although artificial light in room can also prevent the secretion of melatonin as in case of those people who work at night and hence there natural rhythm get disturbed. Sleeping position and posture are also very important for having a good sleep and healthy body. Laying down on the back is considered as the best sleeping position for your spine and neck health. Wrong sleeping posture can result in heart burn and snoring.

2. PHASES OF SLEEP

During sleep usually we pass through two phases that is non rapid eye movement (NREM) and Rapid Eye movement (REM). NREM which consist of four stages. In the first stage we swiftly enter in and out of sleep can be easily awakened. It's the beginning of sleep, slow eye movement. The person awakened from stage one often find himself fully awake. He remembers distorted visuals images and can also experience sudden muscle contractions. Stage two shows slower or no eye movement and person can be awaken easily as shown in the

recordings of (EEG) electroencephalography which is used to monitor the brain activity. This stage is characterized by sleep spindle. The other is k complex which is a wave form recorded in EEG is the largest event in healthy human sleep cycle. It has two functions: first to suppress the response to stimuli and second is to assist and stabilize the memory traces. Stage 3 is the beginning of deep sleep and slow delta waves are recorded in this phase. Dreaming is very common in this phase. Next is the stage 4 which is referred to the state of intense "deep sleep". It's difficult to awake a person in this stage. Sometimes stage 4 is considered a part of stage three and include slow wave sleep (SWS) which indicate the phase of deep sleep. When we enter the (REM STAGE) rapid eye movement phase our breathing becomes fast and irregular, our heart rate increases, random eye movements and limbs become paralyzed. When a person is awakened from this phase often narrate eccentric tales or dreams. Lucid dreams where a person knows that he is dreaming is common in REM. This phase is also called as paradoxical sleep or desynchronized sleep because of physiological similarities to waking state.

Paradoxical sleep include use of gamma amino butyric acid (GABA) and orexin (hypocretin) which are two neurotransmitters that promote wakefulness and inhibit paradoxical sleep and decreases during deep sleep. A complete sleep cycle takes 90 to 110 minutes. By the late morning people spend most of the time in stage 2, 3 and REM. The amount of sleep a person takes depends on the age and other factors related to individual person. The standard sleep for newborn(0-3 month) is 17-18 hours, infant (4-11 month) 12-15 hours, teenagers – 9 hours, adult 7-8 hours, and pregnant women in the first trimester sleep more than usual. Now interesting thing about long sleeping pattern of newborn is that it's a crucial time for their body growth and development of their vital physiological function. During sleep not only baby becomes longer but also heavier. Baby boy tend to nap faster than girls but sleep for shorter burst. Breast feed babies take more frequent and shorter naps than fed with bottle milk. It has been observed that the hormonal cycle is activated in babies during sleep and high concentration of growth hormone is measured in their blood.

3. BENEFITS OF SLEEPING

The benefits of sleep are that it provides good memory and faster learning. It sharpens the attention rate, increases fitness and makes body disease free. After sleeping there are less mood swings, headaches and anxiety. It provides relief in diabetes and heart attacks or heart related diseases. A well slept person thinks positively, has healthy skin and repairs one's body easily, catches cold less frequently etc. Sleep also prevent cancer as it is observed that those people who do night shifts are vulnerable to colon and breast cancer. Sleep improves acquisition (to introduce new information in brain), consolidation (processes that make memory stable), and recall (able to access information that is stored).

4. FACTORS AFFECTING SLEEP

Factors affecting sleep are stress, depression, workload, surrounding, eating patterns, pain etc. Light is an important factor affecting sleep as it decreases the melatonin level and inhibit sleep. Stimulants such as caffeine, alcohol, nicotine also work like light and inhibit sleep. Taking sleeping pill for long and then avoiding them can disrupt the sleep cycle.

5. SLEEP DISORDERS

Sleep disorders also known as **somnipathy**. These are defined as medical disorders of sleeping patterns in animals including human. Common sleep disorders are **sleep apnea** means stopping of breathing during sleep, **narcolepsy** means loss of ability of brain to control sleep cycle so the person sleep excessively during day time, **hypersomnia** means sleeping during inappropriate times, **cataplexy** means sudden loss of muscle tone while awake, sleeping sickness means disruption of sleep cycle due to infection. Problems associated with abnormal sleep wake cycle are **insomnia** a common sleep disorder in which a person finds it difficulty in falling asleep, waking at nights, waking early in morning and feeling tired after waking are the common symptoms. **Circadian rhythm sleep disorders CRSD** are the sleep disorders associated with timing of sleep. **Jet leg** is a temporary condition which arrives when we travel a very long distance and our internal clock is working according to the previous time. Example going to America from India have time difference which disturbs the sleep cycle but after a week it get entrained to the new time. **Advanced sleep phase disorder ASPD** here the person feels sleepy very early in the evening (6-8pm) and wake up early in the morning (3.am). **Delayed sleep phase disorder DSPD** is the dysregulation of person's circadian rhythm and people have great ability to sleep during morning. **Parasomnias** are under the category of sleep disorders that include abnormal movements, somnambulism means walking in sleep, night terrors, bruxism means teeth grinding, limb movements and awaken in a confused state. **Parasomnias** include **bedwetting, bruxism, and catathrenia** means nocturnal groaning, exploding head syndrome means waking up in night hearing loud noises, **somnambulism, somniloquy** means sleep talking.

Khumbkarana the mythological character from Ramayana is famous for his sleep pattern, sleeping for 6 months and remaining awake for 6 months. Scientist declared the reason behind the problem of oversleeping in an article published in the "Indian Journal of Endocrinology and Metabolism", doctors believed that Kumbhakarna might have suffered from hypothalamic obesity. Due to which there is abnormality in the region of brain called hypothalamus that controls appetite. Some scientist claim that khumbkarna was suffering from hypothyroidism, sleep apnea and obesity. In Ramayana it was described that when he woke up he drank 2000 pitchers of water. Polydipsia means abnormally great thirst a feature of diabetes insipidus.

6. VIEWS OF PEOPLE HAVING NIGHT SHIFTS:-

- Raghav rawat - I have been doing night shifts for last 5 months and it has become a routine but I think it definitely affect my life style and my health. Sometimes it feels very dizzy and lethargic also.
- Ashish Dewadi – night shifts exhaust our mind totally and we can't be stay active after that. It surely affects our health and lifestyle.

7. CONCLUSION

We conclude that sleep and health are interconnected with each other. For a better health we need to take appropriate amount of sleep. As sleep plays a vital role to build our mental and physical health. So being healthy not only means disease free but it includes all the aspects by which our physiological functioning is going on. Irregular sleep can lead to countless health problems and severely affect our health and we may tend to become the residence for many diseases. Therefore we must take pertinent sleep and make a way towards healthy living.

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