GETTING MY ZZZs

Types and Stages of Sleep

Sleep plays a vital role in our mental well-being. Sleep involves a cyclical pattern with two distinct components: Non-REM (Rapid Eye Movement) plus REM.

During Non-REM sleep, there are 4 stages, which are less emotional and have fewer visual dreams. Stage 1 is usually the first 5 minutes of the changeover to sleep as a person feels like going in and out of sleep. There are sudden jerky muscle twitches or hypnic myoclonic jerks. Stage 2, or 'light sleep,' lasts for about 10 to 25 minutes. As the body prepares for sleep during this phase, the heart rate slows down, body temperature decreases, and brain wave activity slows down. Stage 3, often called the first stage of sleep, is where it is hard to awaken someone; if the person is awakened, the person will feel confused for a few minutes. Moreover, brain wave alternates between slow and fast wave activity, and the blood flows from the brain to restore other parts of the body. During stage 4, which is the deepest state of sleep, the brain wave is at its slowest frequency waves – delta waves. The other wave categories are beta, alpha, and theta.

3 Major Functions of Sleep

1. Recharges the body from daily activities
2. Protects the body when sensory functions are shut down
3. Allows the brain the needed time to unite important experiences and memories for learning

Sleep Duration

While most adults need 7-8 hours of sleep per night, there are many factors such as behavioral, demographic, health, and genetic, which can restrict the amount of sleep. For example, caring for an infant, working an extra job, or being a student can place demands on a person's time and ability to get some shut eye. "Acute sleep loss is no sleep for 25-72 hours continuously. Chronic sleep deprivation is restricted sleep time (4 to 7 hours a night) over the course of several consecutive nights."

Sleep Restriction and Obesity

Studies show that sleep restriction can lead to obesity from three major processes: (1) metabolic and neuroendocrine function, (2) glucose regulation, and (3) waking behavior.

Metabolic and Neuroendocrine Function:

With consecutive nights of sleep deficiency, the following changes occur:

1. Both the sympathetic nervous system and evening cortisol production are elevated. The evening cortisol production has been shown to increase food consumption and abdominal fat buildup.

2. Leptin secretion levels lower. The significance of leptin secretion is that it comes from fat cells and communicates that fat energy balance messages to the hypothalamus, which is the brain center hunger. So, when the leptin levels decrease, the hypothalamus thinks that the fat cells need more food and guides the body to eat more.

3. Ghrelin, a hunger hormone produced and secreted for the stomach, increases higher levels of ghrelin triggers hunger and food consumption by the hypothalamus.

4. Peptide tyrosine tyrosine (PYY), a protein secreted from the gastrointestinal tract when food is digested, levels decrease. Consequently, the low presence of PYY also triggers the hypothalamus to tell the body to eat more.

Glucose Regulation Processes:

Chronic sleep debt and obesity can interfere with glucose metabolism, which is tied to diabetes. Glucose is a major factor to regulate the appetite. With lack of sleep, glucose regulation is restricted in parts of the brain, which in turn promotes hunger and food consumption.

Waking Behavior:

Since waking behavior tends to include more sedentary behaviors, if people are sleeping less and have more waking hours then they tend to have more opportunities to eat. Then, they eat more high-energy drinks/food if they feel tired during the day.

Sleep and Cognitive Performance

Both acute and chronic sleep deficit will negatively affect learning and thinking.

1. Loss of attention and alertness: instability in several cognitive processes such as working memory
2. Creative and innovative mental processes tend to be more negatively diminished when compared to decision making and planning tasks.

Signs of Sleep Deprivation

1. Difficulty concentrating
2. Memory problems
3. Irritability and moodiness
4. Reduced ability to cope and deal with stress
4. Sleepiness in meetings, lectures, or warm rooms
5. Rely too much on the snooze button

6. Difficulty concentrating
7. Impaired motor skills
8. Weight gain
9. Have a hard time getting out of bed

Practical Sleep-Hygiene Tactics

1. Create a sleep-friendly bedroom by doing the following: use comfortable linens and pillows, keep the room cool, replace a worn-out mattress, and hang darker shades
2. Avoid alcohol and caffeine in the hours before bed
3. Limit your bedroom to relaxation and release activities such as sleep and lovemaking
4. Stick to a regular bedtime and wake-up schedule
5. Avoid bringing food, paperwork, or work projects to bed
6. Develop relaxing habits such as light stretching, hot baths, and reading
7. Drink fewer fluids after dinner to limit the number of times getting up to use the restroom

The journal Annals of Internal Medicine reported that people burned, on average, 400 additional calories by sleeping for 3 more hours – an extra 2,800 calories burned in 1 week. When a person gets less sleep, the metabolic rate slows down and burns calories more slowly in order to preserve energy since the person uses more waking hours.