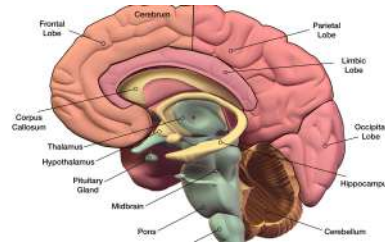


WHAT SCIENCE EXPLAINS ABOUT DREAMS AND NIGHTMARES

Introduction

Dreams and nightmares are natural phenomena that occur during sleep. They have attracted the attention of doctors, scientists, and philosophers, who seek to understand their nature. Furthermore, dreams may be accompanied by physical responses, such as changes in heart rate and breathing. One interesting aspect of dreams is that people may experience images, hear sounds, and feel different emotions, such as fear, sadness, and happiness.

Where do dreams come from? What is the relationship between dreams and nightmares? How do dreams influence physical responses during sleep?



Development

What Is a Dream?

A dream is a mental and emotional experience consisting of images, thoughts, and sensations that the mind creates and the sleeper experiences during sleep.

1.1. Brain Activity During Sleep

When a person sleeps, the brain does not stop working. Instead, its patterns of neural activity change according to the different stages of sleep. During these stages, different brain regions interact, contributing to the mental experiences known as dreams.

1.2. The Role of Sleep Stages

Sleep is divided into two main types: rapid eye movement (REM) sleep and non-rapid eye movement (NREM) sleep. During REM sleep, dreams are often more vivid and detailed. They may include sequences of images, events, and strong emotions.

During NREM sleep, dreams can also occur, but they may be less vivid or more similar to thoughts and everyday experiences.

Therefore, it is incorrect to assume that dreams occur only during REM sleep. Scientific studies have shown that dreaming can occur during both types of sleep.

1.3. How Does the Brain Create Dreams?

There is no single brain region responsible for all dreams. Instead, several neural networks interact, including:

Memory-related regions: These contribute elements from previous experiences.

Emotion-related regions: These participate in the emotional experiences that may occur during dreams.

Sensory-processing regions: These contribute to the images and sensory experiences that people may experience in dreams.

The interaction between these networks may help create dreams that combine memories, emotions, and images, even when the events seem illogical or unrealistic. However, scientists are still investigating the precise mechanisms responsible for dream formation.

1.4. Why Do Dreams Sometimes Seem Real?

During a dream, a person may experience events that seem real, even though they arise from brain activity during sleep and do not necessarily reflect what is happening in the surrounding environment.

This experience may be related to differences in the activity of brain regions involved in critical thinking and reality monitoring during sleep. As a result, the brain may accept unusual events without questioning them, making dreams feel realistic.

1.5. The Difference Between Dreams and Nightmares

Dreams can include pleasant, neutral, or unpleasant experiences. Nightmares, however, are frightening dreams that may cause feelings of fear, anxiety, or sadness. They can sometimes wake a person up and make them remember the dream clearly.

Nightmares may be associated with stress, anxiety, traumatic experiences, or sleep disturbances. However, occasional nightmares are common and do not necessarily indicate a psychological problem.

1.6. How Do Dreams and Nightmares Affect the Body?

Dreams may sometimes be accompanied by physical responses. For example, during a frightening dream, a person may experience changes in heart rate, breathing, or sweating.

These reactions are connected to the nervous system, which regulates many automatic functions of the body. However, physical responses differ from one person to another, and not every dream produces noticeable changes.

1.7. Can We Control Our Dreams?

Some people experience what is known as a lucid dream. This happens when a person becomes aware that they are dreaming while the dream is still taking place. In some cases, the dreamer may be able to influence certain events in the dream.

However, not everyone experiences lucid dreams, and the degree of control varies. Scientists continue to study this phenomenon to understand how awareness and brain activity interact during sleep.

1.8. Why Do We Sometimes Forget Our Dreams?

Many people forget their dreams shortly after waking up. One possible explanation is that the brain does not always store dream experiences in memory in the same way it stores waking experiences. The moment of awakening, the stage of sleep, and the attention given to a dream may influence whether it is remembered. As a result, some dreams remain clear in our memory, while others disappear quickly.

1.9. How Do Nightmares Occur?

Nightmares occur during sleep when the brain produces frightening or disturbing dream experiences. They often happen during REM sleep, a stage in which brain activity is high and dreams can be particularly vivid.

Several factors may contribute to nightmares, including stress, anxiety, frightening experiences, irregular sleep schedules, and certain medications.

During a nightmare, brain regions involved in emotions may be active, contributing to feelings of fear or distress. At the same time, the brain creates images and events that may seem real, even though the person is asleep.

Sometimes, the body's responses may change during a nightmare, such as an increase in heart rate or changes in breathing. When the person wakes up, they may remember the frightening dream and continue to feel afraid for a short time.

However, scientists are still studying the exact mechanisms that cause nightmares, and their causes can differ from one person to another.

1.10. How Do Dreams Affect the Body?

Dreams, especially those that occur during rapid eye movement (REM sleep), can influence the body and its vital functions. Although a sleeping person appears physically still, the brain and nervous system remain highly active.

Temporary Muscle Paralysis (REM Atonia)

During REM sleep, the brain temporarily inhibits voluntary muscle movements. This mechanism helps prevent the body from physically acting out movements in dreams, reducing the risk of injury to the sleeper or others.

Increased Heart Rate and Blood Pressure

The body may react to dreams, especially emotional or frightening ones. Heart rate may increase, blood pressure may fluctuate, and breathing may become faster and less regular, sometimes resembling the body's responses during wakefulness and emotional arousal.

• Blood Flow and Brain Activity

- During REM sleep, brain activity increases in regions involved in emotions, such as the amygdala, as well as in areas involved in visual processing and imagination. Meanwhile, some regions associated with logical and critical thinking show different patterns of activity.
- The dreamer may experience emotions such as fear, happiness, or anxiety as if the events were actually happening.

• Hormonal Regulation and Memory Consolidation

- Sleep contributes to the regulation of certain hormones and supports memory consolidation by helping the brain organize new information and integrate it with existing memories.

Conclusion

1. Dreams accompany human beings like a shadow. They may act like a mental companion, helping the brain process emotions, fears, thoughts, and memories. Although dreams do not replace professional treatment for psychological difficulties, studying them can help us better understand the relationship between the brain, emotions, and memory.