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ETIOLOGY OF INSOMNIA AND ITS PHYSIOLOGICAL AND
PSYCHOLOGICAL EFFECTS ON THE HUMAN ORGANISM

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Annotation: The study highlights the role of neurophysiological mechanisms, including the imbalance of neurotransmitters such as serotonin, dopamine, and gamma-aminobutyric acid (GABA), as well as disruptions in circadian rhythm regulation and melatonin secretion. Psychological factors such as stress, anxiety, and depression are also identified as significant contributors to the development and persistence of insomnia. Furthermore, the research examines the wide-ranging physiological consequences of insomnia, including impaired cognitive function, weakened immune response, hormonal imbalance, and increased risk of cardiovascular and metabolic disorders. The psychological impact is also discussed, focusing on emotional instability, reduced concentration, memory impairment, irritability, and decreased quality of life. Insomnia is presented as a complex health condition requiring a comprehensive approach that addresses both its causes and consequences. The study emphasizes the importance of early diagnosis, preventive measures, and integrated therapeutic strategies to improve sleep quality and overall human health.

Keywords: Insomnia, sleep disorder, etiological factors, neurophysiology, neurotransmitters, circadian rhythm, melatonin, psychological stress, anxiety, depression, cognitive impairment, physiological effects, immune system, cardiovascular system, mental health, sleep deprivation, quality of life.

Sleep is a fundamental biological necessity that plays a crucial role in maintaining physical health, cognitive functioning, emotional stability, and overall quality of life. Among various sleep disorders, insomnia (insomniya) is one of the most prevalent and clinically significant conditions affecting individuals across different age groups and socio-economic backgrounds. Insomnia is characterized by persistent difficulties in initiating sleep, maintaining sleep, or experiencing restorative sleep despite adequate opportunities for rest. In contemporary medical and psychological research, insomnia is not merely considered a symptom but a complex disorder with multifactorial etiology and wide-ranging consequences for both physiological and psychological health.

The increasing prevalence of insomnia in modern societies has become a major public health concern. Rapid urbanization, technological advancement, increased exposure to digital devices, chronic stress, and irregular lifestyles have significantly contributed to the disruption of normal sleep patterns. As a result, insomnia is now recognized as a disorder that affects millions of people worldwide, leading to decreased productivity, impaired cognitive performance, and increased risk of both mental and physical illnesses.

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Understanding the etiology of insomnia and its effects on the human organism is therefore essential for developing effective prevention and treatment strategies.

From a medical perspective, insomnia is classified into primary and secondary forms. Primary insomnia refers to sleep disturbances that are not directly associated with other medical or psychiatric conditions, whereas secondary insomnia occurs as a consequence of underlying disorders such as depression, anxiety, chronic pain, cardiovascular diseases, or neurological conditions. This classification highlights the complexity of insomnia and its close relationship with various systemic health issues.

The etiology of insomnia is multifactorial and includes biological, psychological, behavioral, and environmental factors. Biologically, abnormalities in the regulation of the circadian rhythm and dysfunctions in neurotransmitter systems—particularly those involving serotonin, dopamine, and gamma-aminobutyric acid (GABA)—play a significant role in sleep disturbances. Genetic predisposition may also contribute to individual susceptibility to insomnia, suggesting that sleep regulation is partly influenced by hereditary factors.

Psychological factors are among the most significant contributors to insomnia. Chronic stress, anxiety disorders, depression, post-traumatic stress disorder (PTSD), and emotional instability are strongly associated with sleep disturbances. Individuals experiencing high levels of cognitive arousal, such as excessive worrying or rumination, often find it difficult to initiate or maintain sleep. Moreover, maladaptive thought patterns and conditioned fear of sleeplessness can further perpetuate insomnia, creating a vicious cycle that becomes increasingly difficult to break.

Behavioral factors also play a crucial role in the development and persistence of insomnia. Poor sleep hygiene, irregular sleep schedules, excessive consumption of caffeine or alcohol, prolonged use of electronic devices before bedtime, and lack of physical activity are common contributors to sleep disruption. In modern lifestyles, exposure to blue light emitted by smartphones, computers, and televisions has been identified as a significant factor that suppresses melatonin production, thereby delaying sleep onset and disrupting circadian rhythms.

Environmental factors, including noise, light pollution, uncomfortable sleeping conditions, and shift work, further exacerbate sleep disturbances. Individuals working in night shifts or rotating schedules are particularly vulnerable to circadian misalignment, which significantly increases the risk of chronic insomnia. Additionally, socio-economic stressors such as financial instability, occupational pressure, and academic workload can also contribute to the development of sleep disorders.

The physiological effects of insomnia on the human organism are extensive and involve multiple body systems. One of the most immediate consequences is the impairment of the central nervous system. Sleep is essential for brain recovery, memory consolidation, and neural plasticity. Chronic sleep deprivation disrupts these processes, leading to reduced attention span, impaired decision-making, slower reaction times, and decreased cognitive performance. Long-term insomnia has also been associated with an increased risk of neurodegenerative disorders, including Alzheimer's disease.



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In addition to neurological effects, insomnia has a profound impact on the cardiovascular system. Persistent sleep deprivation is associated with increased sympathetic nervous system activity, elevated blood pressure, and higher levels of stress hormones such as cortisol and adrenaline. These physiological changes contribute to an increased risk of hypertension, coronary artery disease, stroke, and other cardiovascular complications.

The immune system is also significantly affected by insufficient sleep. Sleep plays a vital role in immune regulation and inflammatory response. Individuals with chronic insomnia often exhibit weakened immune function, making them more susceptible to infections and slowing down the healing process. Furthermore, insomnia has been linked to increased levels of systemic inflammation, which is considered a risk factor for various chronic diseases, including diabetes and cancer.

From a psychological perspective, insomnia has profound effects on emotional regulation and mental health. It is both a symptom and a contributing factor to various psychiatric disorders. Individuals suffering from chronic insomnia are at higher risk of developing depression, generalized anxiety disorder, irritability, mood swings, and emotional instability. Sleep deprivation impairs the brain's ability to regulate emotions effectively, leading to heightened sensitivity to stress and reduced coping abilities.

Moreover, insomnia negatively affects social functioning and overall quality of life. Individuals experiencing chronic sleep disturbances often report decreased motivation, reduced work performance, difficulties in interpersonal relationships, and lower life satisfaction. The cumulative effect of these impairments can lead to a significant decline in both personal and professional well-being.

Insomnia is a complex and multifaceted sleep disorder with diverse etiological factors and wide-ranging physiological and psychological consequences. Its development is influenced by an interplay of biological predisposition, psychological stressors, behavioral habits, and environmental conditions. The impact of insomnia extends beyond simple sleep loss, affecting nearly every system of the human body and significantly impairing mental health and quality of life. Therefore, a comprehensive understanding of its causes and effects is essential for the development of effective diagnostic, preventive, and therapeutic approaches. Insomnia is a complex and multifactorial sleep disorder that has become increasingly prevalent in modern society. Its etiology involves a dynamic interaction of biological, psychological, behavioral, and environmental factors. Neurophysiological disturbances, particularly in neurotransmitter systems such as serotonin, dopamine, and GABA, as well as disruptions in circadian rhythm regulation, play a fundamental role in the onset and persistence of insomnia. At the same time, psychological conditions such as chronic stress, anxiety, and depression significantly contribute to sleep disturbances and often create a self-perpetuating cycle of sleep loss and emotional instability.

The physiological consequences of insomnia are extensive and affect nearly all major systems of the human body. Prolonged sleep deprivation leads to impaired cognitive functioning, reduced immune response, hormonal imbalance, and increased risk of

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cardiovascular and metabolic diseases. These changes highlight that insomnia is not merely a sleep-related issue, but a serious health condition with systemic effects on human physiology.

From a psychological perspective, insomnia has a profound impact on emotional regulation, cognitive performance, and overall mental health. It is closely associated with irritability, decreased concentration, memory impairment, and a higher risk of developing mood disorders such as depression and anxiety. Moreover, insomnia significantly reduces quality of life and social functioning, affecting both personal well-being and professional productivity.

In conclusion, insomnia should be understood as a multidimensional health problem that requires a comprehensive and integrative approach. Effective management must address not only the symptoms but also the underlying etiological factors. Early diagnosis, lifestyle modification, psychological support, and medical intervention are essential for preventing its long-term consequences and improving overall health outcomes

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