



THE INFLUENCE OF ENVIRONMENTAL BIO-PHYSICAL AND CHEMICAL FACTORS ON THE HUMAN BODY

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Abstract: In recent years, genetically modified organisms (GMOs), which can cause outbreaks of infectious diseases and disrupt the balance of ecosystems, having a negative impact on the environment and the human body.

Keywords: ecology; health; environmental factors; especially dangerous infections (EDI); noise; radiation; malignant tumors

Introduction: Ecology is the science of the interactions between living organisms and their environment. Human health largely depends on environmental factors, which can affect the body both positively and negatively. Environmental factors play a significant role in daily human health and well-being (1). This scientific work examines the impact of biological, physical, and chemical environmental factors on the human body.

Biological factors include microorganisms, viruses, and parasites that can cause infectious diseases (2). Physical factors, such as ultraviolet radiation, radiation, and noise, can have negative effects on health. Chemical environmental factors, including air and water pollution, toxic substances, pesticides, heavy metals, and other chemicals, can lead to various diseases, including allergies, poisoning, and cancer (3, 4). Understanding the impact of these factors on human health is crucial for developing measures to protect the environment and ensure the safety and well-being of the population.

Ecology studies the interaction between living organisms and their environment. It is important to note that human health is significantly influenced by the state of the environment, which can have both positive and negative effects on the body. According to the World Health Organization (WHO), health is defined as a state of complete physical, mental, and social well-being and not merely the absence of disease.

Environmental factors affecting human health can be divided into two categories: biotic factors associated with living nature (e.g., microbiological factors) and abiotic factors associated with inanimate nature (e.g., physical and chemical factors). The main negative microbiological factors include viruses, bacteria, protozoa, and fungi, which can release toxic substances into the environment. Pathogenic microorganisms can be sources of especially dangerous infections (EDI) that pose a threat to humanity. Mass outbreaks of infections, such as plague and cholera, which can be transmitted through contact, can lead to epidemics and significant changes in natural ecosystems.

In recent years, genetically modified organisms (GMOs) have been increasingly used, potentially causing outbreaks of infectious diseases and disrupting the balance of ecosystems, thereby negatively impacting the environment and human health.

Methods: To study the impact of environmental factors on human health, a review of the scientific literature on this topic was conducted. The results of previous studies in the fields of ecology and human health, as well as data from the World Health Organization and other medical organizations, were analyzed.

Results: Among the main physical factors negatively affecting humans are noise, radiation, radioactivity, and electric current. Noise is a significant physical factor, as excessive exposure can lead to serious health consequences, including increased blood pressure, sleep disturbances, stress, and ischemic heart disease. Therefore, the impact of noise on the human body should not be underestimated. Radiation,

including ultraviolet (UV) radiation, has both positive and negative effects. While UV radiation promotes the production of vitamin D, which strengthens bone tissue, excessive exposure can lead to negative consequences such as erythema (skin burns), headaches, fatigue, and increased heart rate. Chronic exposure to radiation can result in various types of skin cancer:

- Melanoma: a malignant tumor of the skin.
- Basal cell carcinoma (BCC): a slowly developing skin cancer more common in older individuals.
- Squamous cell carcinoma (SCC): a malignant tumor that develops slowly and is less likely to cause death.

According to WHO, in 2019, 1.6 million people of working age (15 years and older), or 28% of the entire working-age population, were exposed to UV radiation from the sun during outdoor work. That year alone, non-melanoma skin cancer caused by outdoor sun exposure resulted in nearly 19,000 deaths across 183 countries, with 65% of the victims being male.

Chemical factors are particularly dangerous due to their ability to accumulate in the human body and cause chronic poisoning. They can manifest in various ways, including:

- Toxic effects leading to allergic reactions.
- Skin irritation.
- Formation of malignant tumors.
- Genetic changes.

With short-term but high-dose exposure, acute intoxication may occur, and extremely high doses can be fatal.

It has been found that biological, physical, and chemical factors have diverse effects on human health. Biological factors, such as infections, can cause a wide

range of diseases, including especially dangerous infections. Physical factors, including noise and radiation, can lead to various health issues, such as sleep disorders and skin cancer development. Chemical factors, such as toxic substances in the environment, can cause poisoning and other serious diseases.

Discussion: This study confirmed the importance of understanding the impact of environmental factors on human health. The results underscore the need to develop and implement measures to protect the environment and improve public health.

Conclusion: Environmental factors, including biological, physical, and chemical influences, play a significant role in determining human health and well-being. Studying and understanding the impact of these factors on the human body is crucial for our well-being and has significant implications for public health and environmental safety. A comprehensive understanding of environmental factors and their effects on human health, along with effective risk reduction measures, is essential for creating a healthy and safe living environment, improving quality of life, and reducing the burden of disease in the population.

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