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Investigating the Effects of Climate Change on the Humans Health

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ABSTRACT
Climate change, which is the main cause of air and environmental pollution, is a major global challenge that significantly affects human health and causes the premature death of seven million people annually. Environmental changes in the frequency, intensity, type of rainfall and extreme weather events such as heat waves, droughts, floods, lightning, sandstorms and hurricanes have occurred and are real and daunting challenges for human health and the biosphere that affect Water and food resources. Urbanization, with high levels of greenhouse gas emissions from vehicles and western lifestyles, is associated with increased levels of particulate matter in the air and food sources, soil, fresh water, and oceans. These environmental changes are associated with an increase in the frequency of allergic respiratory diseases, cardiovascular, cancer, heat-related mortality, diseases caused by food and nutrition, stress-related disorders, and bronchial asthma, which have been observed in most industrialized countries in recent decades and are continuously increasing in developing countries. The purpose of this review is to evaluate the recent evidence on the effects of climate change on air and environmental pollution and pollution-related health effects and to identify avenues of knowledge for future research.

Keywords: Climate change, Pollution, Environment, Human health, temperature.

INTRODUCTION
According to the United Nations Framework Convention on Climate Change (UNFCCC), climate change is defined as "climate change attributable directly or indirectly to human activities that alters the composition of the planet's atmosphere and leads to changes in water and It adds a natural airiness to the observed at similar time intervals" (Marazziti et al., 2021) The two main pollutants that are precursors to ozone formation are nitrogen oxides (NOx) (primarily emitted from burning fossil fuels) and volatile organic compounds (VOCs) (from both fuel burning and evaporation from vegetation and stored fuels). Emissions of anthropogenic and biogenic volatile organic compounds increase with temperature, and NOx emissions can also increase with temperature due to increased combustion of fossil fuels to generate electricity during heat waves. Ozone-forming reactions also occur faster with more sunlight and higher temperatures, so ozone concentrations are highest in hot weather, especially in summer. (Fiore et al., 2015) The atmosphere is a thin shell of gases, particles and clouds that surrounds this planet and we discharge billions of tons of pollutants into this thin shell every year. The main sources of this pollution include fossil fuel combustion for electricity generation and transportation. The lifetime of a CO_2 molecule in the atmosphere is about a century or more, which is more than enough time for billions of tons of man-made CO_2 to uniformly cover the planet like a blanket. (Ramanathan & Feng, 2009)

AIR AND ENVIRONMENT POLLUTION AND HUMAN DISEASES
Asthma, allergies and respiratory diseases
Today, allergies and respiratory diseases are common diseases, one of the reasons for which is climate change. Increasing the duration of exposure to plant pollen, mold (caused by heavy or frequent rain), air pollution and toxic marine aerosols (caused by increasing temperature, coastal runoff and humidity) and dust caused by drought are among the most important reasons for the increase in diseases. Respiratory is caused by climate change. Early life and current exposure to air pollution may increase the risk of developing respiratory diseases, especially asthma. In one study, a direct relationship between exposure to PM10 and NO2 more at birth and a higher probability of developing asthma at the age of 20 has been identified. Asthma patients

exposed to higher levels of PM2.5 and ozone were more likely to develop chronic obstructive pulmonary disease (COPD).

Still another study found that the association between exposure to traffic-related air pollution and increased lifetime risk of allergic rhinitis occurred in an exposure-dependent manner (Deng et al., 2022).

Cardiovascular diseases and stroke

Climate changes may lead to an increase in cardiovascular diseases through increasing heat stress, increasing suspended particles in the air, and changing the distribution of common pathogens between humans and animals, causing infectious cardiovascular diseases. One of the diseases caused by global warming is the vascular disease Erythromelalgia, which is caused and aggravated by temperature changes, and its first and second degree types include pain, burning, increased temperature, and swelling of the hands and feet. Various people such as the elderly, workers with heavy physical activity and people with cardiovascular diseases and heart failure are more vulnerable to higher temperatures. Epidemiological studies have proven that the risk of cardiovascular events increases with long-term and short-term exposure to air pollutants such as PM2.5, NOx, and ozone. Higher levels of suspended particles and gaseous air pollutants cause high blood pressure and increase systolic and diastolic blood pressure. People with long-term exposure to PM2.5 have a high risk of cardiovascular mortality due to ischemic heart disease, arrhythmias, and heart failure. A meta-analysis has shown that a 10 mg/m3 increase in PM2.5 levels was associated with a 2.5% increase in the relative risk of myocardial infarction (MI) on the same day or the day after the increase. (Keswani et al., 2022).

Cancer

The exact mechanism of cancer in humans and animals is not fully understood, but the main factors in the development of cancer are: pathogens, environmental pollutants, age and genetics. The potential and direct impact of climate change causes disruption in the process of repairing the layer. Ozone and UV rays will increase in some latitudes, and on the other hand, the increase in temperature resulting from climate change will cause sunburn and consequently the risk of skin cancer will increase. Also, the increase in the evaporation of chemicals under the increase in temperature is a direct effect of climate change, which causes cancer (Makin, 2018).

Heat-related mortality

The effect of increasing temperature can cause muscle cramps, heat exhaustion, heat stroke and death. Long-term exposure to heat can increase mortality and some chronic diseases such as respiratory, brain, cardiovascular and psychological diseases. Among the different age groups, the sensitivity of the age group over 65 and children and babies under one year to heat is more than other groups. Urban centers, especially due to the urban heat island, are often more affected by the consequences of heat than other areas such as rural centers and suburbs (Vicedo-Cabrera et al, 2023)

Diseases caused by food and nutrition

Rising temperatures, changing weather patterns, and extreme events have consequences such as pollution, corruption, and disruption in food distribution. Research shows that the higher level of carbon dioxide reduces the nutritional value of agricultural products despite the increase in their growth, in fact, climate change with the lack of main food elements, malnutrition and food pollution, especially marine food pollution with chemical pollutants, biological toxins and pathogenic pathogens due to extreme weather events, changes in temperature and precipitation patterns can affect human health. In general, food-related diseases increase by 1-0.1% with every one-degree Celsius increase in temperature (Keswani et al., 2022).

Mental health and stress-related disorders

Mental disorders include mild disorders such as social phobias and fear, as well as severe illnesses such as depression and suicidal thoughts. While all people are exposed to the negative effects of climate change, people with low income are more vulnerable to the psychological effects of climate change. In fact, poor people are 1.6 times more at risk of psychological effects due to climate change than high income people and women are 2 times more than men. The direct effects of climate change and extreme weather events, such as storms, floods, fires, and heat waves, which cause negative changes in the landscape and destruction of areas and

agriculture, and finally cause economic collapse. After that, communities are exposed to loss of livelihood and poverty, which will lead to disorders such as depression, isolation, sadness, deprivation and homelessness. Indirect effects on mental health occur through the impact on physical health, social infrastructure, lack of food and water, or displacement caused by severe, semi-severe, or permanent climate changes (Marazziti et al., 2021).

Basic solutions to eliminate air and environmental pollution

There are many ways to control the factors that cause severe climate change, for example: Renewable fuel and clean energy production (The most basic solution for air pollution is to move away from fossil fuels, replacing them with alternative energies like solar, wind and geothermal), Energy conservation and efficiency, Eco-friendly transportation (Shifting to electric vehicles and hydrogen vehicles, and promoting shared mobility (i.e. carpooling, and public transports) could reduce air pollution.

RESULTS

Climate change affects air quality and air quality directly or indirectly affects human health. The main effects of climate change on air quality are the destruction of removal processes (dispersion, precipitation) and the increase of atmospheric chemistry. One of the main sources of climate change is more and bigger fires. Also, other natural sources include dust storms, transport of dust particles and ozone near the surface, which are from the interaction of precursor compounds (primary and secondary pollutants such as VOCs, CH_4 and CO, which react with hydroxyl radicals) is caused by sunlight, including ultraviolet rays Particulate matter, especially from combustion, can affect cardiopulmonary mortality and respiratory diseases (e.g., asthma, chronic bronchitis, rhinitis). Recent evidence suggests a close relationship between climate change and diabetes, rheumatic diseases, cognitive function and neurological diseases. In addition, gases such as the secondary pollutant ozone are associated with all-cause, circulatory, and respiratory mortality as well as chronic respiratory diseases such as asthma. Studies have linked higher ozone concentrations to preterm birth, reproductive health, and cognitive decline. Studies show that climate change could reduce global production by 10% by 2050. Therefore, climate change can affect public health, especially in poorer countries.

CONCLUSION

Climate change is a major threat to social, physical and mental health. The impact of climate change on health is greater in low-income countries where the capacity to accept this phenomenon is weak. Adaptation strategies can reduce some of these adverse effects, but their implementation is problematic, especially in poor countries. Therefore, it is necessary to assess vulnerabilities and identify cost-effective options in the health sector, one of which is the use of renewable energy, which reduces air pollution and subsequently controls climate change. Psychologists also have a moral duty to take quick actions to reduce psychological harm caused by climate change, to reduce global differences, and to acquire specific skills and training in psychology for continuous improvement of climate related issues, programs and studies and research are needed. are in harmony

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