Editorial

Mental Health in the Era of Climate Change

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Climate change is considered by the World Health Organization (WHO) as the most significant environmental threat that humanity is currently confronting (1). Adverse consequences of climate change on human rights are more likely to have their most significant impact on populations already experiencing violations of their human rights, such as residents of low-income countries and economically disadvantaged communities in high-income countries, minorities, unemployed, those living in unsafe or marginalized environments, and individuals with chronic illnesses or disabilities (2).

Climate change is undoubtedly a relevant factor in the increasing incidence of mental health disorders. It has been associated with an increase in the prevalence of mental illnesses such as depression, anxiety, and post-traumatic stress disorder (3). In the "Revista Ciencia y Humanismo en la Salud", which has been circulating since 2014, seven articles have been published about the importance of family support in individuals with alcoholism, coping with stress in oncologic patients, the mental health of physicians, glucose levels and depressive symptoms, depression in older adults, social isolation and loneliness in aging, instruments for measuring COVID-related anxiety, mental health and exercise in students during the COVID pandemic. However, none of them have focused on mental health in the context of climate change.

It is projected that heat-related mortality will increase in North America due to aging populations, poverty, diseases, inadequate public healthcare systems, and climate change. Climate change is also expected to lead to a wide range of mental health issues and increased psychological burdens, especially for those who already have mental health problems, live in severely affected areas, or rely on the climate for their livelihoods and cultural well-being, such as farmers (4). High temperatures have a direct effect on people's health, fatigue and discomfort from dehydration or heat exhaustion can lead to increased irritability and concentration difficulties (5). Heatwaves significantly increase the risk of hospital admissions for mental and behavioral disorders, likehood of hospitalization for mood disorders increased 16% during periods of high heat. (6, 7). Additionally, a study conducted by Hu et al. found that suicide rates rose by 1% for each 1°C increase on average monthly temperature (8).

The impact of climate change on mental health include: i) indirect effects of extreme heat, disasters, and environmental changes, ii) indirect impact through observing or worrying about global events and concerns about future risks, and iii) psychosocial impact at the community and regional levels (9,10). These impacts of climate change on mental health primarily affect the socioeconomically disadvantaged population (2).

Climate justice involves the equitable distribution of the benefits and burdens associated with climate change and seeks to address the inequalities that arise from this phenomenon. To understand its relationship with mental health and non-communicable diseases (NCDs), it is essential to consider how climate change disproportionately affects marginalized and vulnerable communities. People living in low-income areas, densely

populated urban areas, or regions prone to natural disasters face a higher risk of exposure to air and water pollution, food insecurity, and a lack of access to quality healthcare services. These environmental stressors have a significant impact on people's mental health, increasing levels of anxiety, depression, and stress-related disorders.

One key concept in climate justice is the “polluter pays" principle, which aims to hold entities and countries that contribute the most to climate change responsible for the damages caused. This principle is crucial for addressing NCDs, as many of the major industries and greenhouse gas-emitting nations are also responsible for producing and promoting products harmful to health, such as ultra-processed foods and tobacco. Therefore, climate justice demands not only a reduction in greenhouse gas emissions but also the promotion of public health policies that address NCD-related risk factors and protect the health of vulnerable communities (11).

Climate justice and mental health are two interconnected and critically important issues, especially in the context of NCDs. NCDs, such as cardiovascular diseases, type 2 diabetes, and cancer, represent a substantial public health burden globally. Furthermore, climate change is exacerbating risk factors associated with these diseases, such as air pollution, food scarcity, and inadequate access to healthcare. The connection between climate justice and mental health becomes even more apparent with the concept of "eco-anxiety". Eco-anxiety refers to the emotional and psychological distress experienced by individuals due to concerns about climate change and its impacts on the environment and society (12). This constant worry can have detrimental effects on mental health, increasing level of stress, anxiety, and depression. Populations most affected by climate change are often the same ones facing social and economic inequalities, further aggravating the effects on their mental health.

On October 10th, World Mental Health Day is commemorated, it was promoted by the World Federation for Mental Health in 1992 to emphasize that mental health is as important as physical health. This global commemoration is supported by the World Health Organization (WHO) and involves various activities focused on increasing awareness among the general population about mental health, current issues, and steps to reduce the incidence of mental health disorders worldwide. From an external perspective, in 2015, Mexico, as a member state of the Pan American Health Organization (PAHO), joined the 2030 Agenda for Sustainable Development. In this agenda, Mexico committed to ensuring a healthy life and promoting well-being for all ages, including the inclusion of mental health. It stipulates the following goals: reducing premature mortality from NCDs by one-third through prevention and treatment, promoting mental health and well-being, and strengthening the prevention of substance abuse (13). On April 8, 2022, the "Specific Action Program for Mental Health and Addictions 2020-2024" was published, which states that its objective is to take the necessary actions to ensure that by 2024, the population of Mexico can receive free medical and hospital care and achieve overall well-being. To fulfill these objectives, it is necessary to transform the current healthcare system to provide comprehensive leadership in mental health care. The "Specific Action Program for Mental Health and Addictions 2020-2024" states that to achieve the set objectives, it is necessary to increase the prevention and comprehensive care of mental health efficiently and effectively, provide accessibility to quality services for all social strata of the population, train healthcare professionals to promote empathy toward individuals with mental health conditions, ensuring that services are provided with quality, ethics, and respect, and eliminating barriers that have hindered access to healthcare services for a long time (14).

Strategies to address the impact of climate change on health are divided into mitigation actions (primary prevention) and adaptation actions (secondary prevention) (2). To develop actions at these two levels, it is essential that healthcare personnel, particularly future generations of doctors, receive training and preparation on the relationship between climate

change and mental health. An international survey conducted among medical students from 2,817 medical schools in 112 countries reported that only 15% of them included climate change-related topics in their curriculum (15). When searching the study programs of the top 20 universities in Mexico, according to data from the Interinstitutional Commission for Human Resources Training in Health (CIFRHS), ranking them based on the overall average of medical knowledge in the National Medical Residency Exam 2022 (ENARM) (16), When conducting a detailed search in the curriculum of each of the listed universities, it was found that 95% of them offer subjects such as public health, toxicology, or human-environment interrelation. These subjects are expected to raise awareness among future generations of healthcare professionals about the relevance of the environment in the health-disease process, particularly regarding the relationship between climate change and mental health disorders. In addition, the Universidad Autónoma de Yucatán (UADY), ranking nineteenth based on the overall average of medical knowledge in ENARM, offers the subject "Public Health" in the seventh semester of the Medical Degree in the new curriculum of the Comprehensive Training Educational Model (MEFI). In this subject, timely addressing the previously mentioned environmental health issues takes place. The Academic Body of Public Health at the Faculty of Medicine of UADY participates in teaching this subject, contributing to the training of new generations of doctors with that focus (fig. 1).

Conclusions:

It is essential to note that global health problems, as discussed, demand two-pronged solutions: international cooperation and customized local interventions.

To comprehensively address mental health issues in the context of climate change, it is crucial to adopt public health approaches that consider both climate justice and mental health. Policies should be implemented to reduce greenhouse gas emissions, promote sustainable food production and consumption, and ensure equitable access to mental health services. Similarly, it is essential to strengthen the resilience of vulnerable communities through investment in climate-resilient infrastructure, the creation of early warning systems, and the promotion of community participation. Climate change and deteriorating mental health are closely related, and raising awareness of this among new generations of professionals and updating those who have already graduated is essential for a more comprehensive approach to mental disorders in the context of climate change.

Comprehensively addressing the issues related to climate change, climate justice, and mental health is essential to protect the health of the most vulnerable populations and promote a healthier and more sustainable future for all.

Figure 1. Group A of the first generation of students of the subject of Public Health (7th semester) of the career of Medical Surgeon. MEFI Model. Faculty of Medicine. UADY.

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