CC BY SA OPEN ACCESS

DOI: 10.5281/zenodo.18475712
UDC: 616.89-084+551.588.7

POVARA SĂNĂTĂȚII MINTALE A ÎNCĂLZIRII GLOBALE, PROFILAXIE ȘI ADAPTARE

THE MENTAL HEALTH BURDEN OF GLOBAL WARMING, PREVENTION AND ADAPTATION

Ana Langa, Ioana Caliga, Catalina Croitoru
”Nicolae Testemițanu” State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

Rezumat
Introducere. Condițiile de sănătate mintală pot afecta toate aspectele vieții. Având în vedere că impactul încălzirii globale va deveni mai sever, există o nevoie clară de o abordare proactivă pentru îmbunătățirea asigurării sănătății mintale și consolidarea rezistenței în sistemul de sănătate. Profesioniștii subliniază necesitatea urgentă de a înțelege impactul încălzirii globale asupra persoanelor cu afecțiuni neurologice pentru a-și păstra sănătatea și a preveni agravarea inegalităților.
Material și metode. S-a realizat un studiu de tip secundar, sinteză narativă a 20 de surse științifice din baze de date internaționale care abordează problemele de sănătate mintale influențată/agravată de încălzirea globală și metodele, măsurile de profilaxie a agravărilor, a complicațiilor, de adaptare a organismului către efectele condițiilor meteorologice extreme. Studiile au fost identificate folosind termeni de căutare referitori la încălzirea globală, sănătate mintală, maladii neurologice, măsuri de prevenție și adaptare șa fenomenul de mare actualitate. Perioada de referință a fost 2018-2024.
Rezultate. Incidența, internările în spital și riscul de mortalitate pentru multe tulburări de sănătate mintală sunt asociate cu creșterea temperaturii ambientale, fluctuațiile zilnice ale temperaturii sau temperaturile extrem de calde și reci. Rezultatele asupra sănătății mintale includ depresia, anxietatea și emoțiile extreme precum tristețea, furia și frica.
Susceptibilitatea la temperaturile ridicate este agravată de fragilitate, multimorbiditate și medicamente psihotrope.
Cercetătorii observă că, pe măsură ce evenimentele meteorologice adverse cresc în severitate și temperaturile globale cresc, populațiile sunt expuse la înrăutățirea factorilor de mediu care ar putea să nu fi fost suficient de severi pentru a afecta condițiile creierului în unele dintre studiile anterioare. Drept urmare, ei spun că este important să ne asigurăm că cercetarea este actualizată și ia în considerare nu numai starea actuală a schimbărilor climatice, ci și viitorul.
Mai multe studii legate de încălzirea globală au fost asociate cu suferință psihologică, înrăutățirea sănătății mintale și mortalitatea mai mare în rândul persoanelor cu afecțiuni preexistente de sănătate mintală, spitalizări psihiatrice crescute și rate crescute de sinucidere.
Este important să transmitem mesaje comunităților științifice, oamenilor și furnizorilor de servicii medicale pentru a face schimb de resurse împreună cu intervenții educaționale pentru a combate aceste probleme.
Concluzii. Este necesară sprijinirea factorilor de decizie politică pentru a dezvolta politici de atenuare a efectelor și adaptare a organismului uman, dar și evidențierea practicilor adecvate pentru informarea comunității, astfel încât implementarea să aibă loc fără întârziere.
Cuvinte-cheie: încălzire globală; sănătate mintală; temperaturi extreme; val de căldură; țările cu venituri mici

Summary
Introduction. Mental health conditions can affect all aspects of life. Given that the impacts of global warming will become more severe, there is a clear need for a proactive approach to improving mental health provision and building resilience in the health system. Professionals stress the urgent need to understand the impact of global warming on people with neurological conditions in order to preserve their health and prevent worsening inequalities.
Material and methods. A secondary type study was carried out, a narrative synthesis of 20 scientific sources from international databases that address mental health issues influenced/aggravated by global warming and the methods, measures for prevention of aggravations, complications, adaptation of the body to the effects extreme weather conditions. Studies were identified using search terms related to global warming, mental health, neurological diseases, prevention and adaptation measures, and the hot topic. The reference period was 2018-2024.
Results. The incidence, hospitalizations, and mortality risk for many mental health disorders are associated with increased ambient temperature, daily temperature fluctuations, or extreme hot and cold temperatures. Mental health outcomes include depression, anxiety and extreme emotions such as sadness, anger and fear.
Susceptibility to high temperatures is aggravated by frailty, multimorbidity and psychotropic drugs.
The researchers note that as adverse weather events increase in severity and global temperatures increase, populations are exposed to worsening environmental factors that may not have been severe enough to affect brain conditions in some of the earlier studies. As a result, they say it's important to make sure research is up-to-date and considers not only the current state of climate change, but also the future.
Several studies have linked global warming to psychological distress, worsening mental health and higher mortality among people with pre-existing mental health conditions, increased psychiatric hospitalizations and increased suicide rates.
It is important to convey messages to scientific communities, people, and health care providers to exchange resources along with educational interventions to combat these problems.
Conclusions. It is necessary to support political decision-makers to develop policies for mitigation and adaptation of the human body, but also to highlight appropriate practices for informing the community, so that implementation takes place without delay.
Keywords: global warming; mental health; extreme temperatures; heat wave; low income countries

Introduction

Climate change represents the most critical public health crisis of the 21st century. The physical and medical sequelae of climate and weather-related events are well documented and can be addressed in clinical practice. The impact of climate change on mental health is increasingly addressed in the literature, but remains under-recognized by physicians [1].

New global and European temperature records continue to be set. The European region is facing rising sea levels and more extreme weather conditions such as heat waves, floods, droughts and more frequent and intense storms caused by climate change. The precipitation regime is changing, with generally increasing precipitation in humid regions and decreasing precipitation in arid regions. The volume of glaciers and snow cover is decreasing.

Although the international community is collectively trying to limit global temperature rise to less than 1.5°C before 2100, irreversible environmental changes have already occurred, and as the planet warms, these changes will continue to occur. As we witness the effects of global warming on human health, it is imperative that neuroscientists anticipate how the epidemiology and incidence of neurological diseases may change [2].

The phenomenology of the effects of global warming differs greatly – some mental disorders are common and others more specific to atypical climate conditions. In addition, global warming also affects different population groups that are directly exposed and more vulnerable due to their geographical conditions, as well as lack of access to resources, information and protection. Perhaps it is also worth underlining the fact that in some works the connection between climate events and mental disorders was described by introducing new terms, invented only recently: ecoanxiety, ecoguilt, ecopsychology, ecological pain, solastalgia, biospheric concern, etc. [3, 4].

Global warming impacts on mental health through a number of direct and indirect pathways, short-term or long-term effects. Direct pathways include exposure to traumatic events such as wildfires. Indirect pathways operate largely through a range of social, political and economic determinants of mental health, such as poverty, unemployment and housing. Acute events may act through mechanisms similar to that of traumatic stress, leading to well-understood psychopathological patterns. In addition, the consequences of exposure to extreme or prolonged weather events can also be delayed, including disorders such as post-traumatic stress, or even passed on to later generations. Vulnerable people and places, especially in low-income countries, are expected to be particularly hard hit [3, 4, 5]. There is significant heterogeneity between studies in terms of methodology, outcome measures, confounders and study design, including sparse data from low-income countries, but the evidence so far suggests that global warming will alter clinical practice for various disorders major neurological disorders, due to changes in the prevalence, incidence, mortality, morbidity and semiology of the disease, in the near future [6, 7].

Exposure to extreme high temperatures directly affects human well-being, productivity, and cognitive performance, thus presenting a growing concern for human health in relation to global warming. A large number of specialist bibliographic sources document the mental health consequences of climate-related extreme events [4, 5, 8, 9].

Following an analysis of 332 papers published worldwide between 1968 and 2023, the team from the UCL Queen Square Institute of Neurology, said they expected the scale of the potential effects of climate change on neurological diseases to be substantial. They looked at 19 different nervous system conditions, chosen based on the "Global Burden of Disease 2016" study, including stroke, migraine, Alzheimer's, meningitis, epilepsy and multiple sclerosis. Climate variation affecting brain disease included temperature extremes (both low and high) and greater diurnal temperature variation – especially when these measures were seasonally unusual. Nighttime temperatures can be particularly important, as higher nighttime temperatures can disrupt sleep. Poor quality sleep is known to worsen several brain conditions. Researchers found that there was an increase in hospitalizations, disability or death from stroke at higher ambient temperatures or during heat waves [10].

As neurological disorders account for a major share of morbidity and mortality worldwide, global warming requires changes in neurological practice [6].

While climate change and mental health is a rapidly growing area of research, it needs to accelerate and broaden its scope to respond with evidence-based mitigation and adaptation strategies [5].

The purpose consists in the elucidation of some mental health problems influenced/aggravated by global warming and the selection of effective measures for prevention of aggravations, complications, identification of measures to adapt the body to the effects of extreme weather conditions.

Material and methods

A secondary type study was carried out, a narrative synthesis of 20 scientific sources from international databases that address mental health issues influenced/aggravated by global warming and the methods, measures for prevention of aggravations, complications, adaptation of the body to the effects extreme weather conditions. Studies were identified using search terms related to global warming, mental health, neurological diseases, prevention and adaptation measures, and the hot topic. The reference period was 2018-2024.

Results and discussions

Extreme climate phenomena such as heat waves, heavy rainfall, droughts are increasing in frequency and intensity in many regions of the world. Improved climate forecasts provide further evidence that extreme weather events will continue to intensify in many European regions.

Extreme temperatures and their variability are associated with the incidence and severity of stroke, migraines, hospitalisation of dementia patients, seizures in epilepsy patients, and exacerbations of multiple sclerosis. Exposure to air pollutants, particularly PM2.5 and nitrates are the influence of extreme high temperatures is associated with

Key operational definitions

Climate change: The Intergovernmental Panel on Climate Change (IPCC) defines climate change as "a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer" [19].

Mental health: WHO defines mental health as "a state of well-being in which every individual realizes his or her own potential, can cope with the stresses of life, can work productively and fruitfully and is able to make a contribution to her or his community" [19].

the incidence and severity of stroke, headache/migraine, tick-borne encephalitis, risk of Alzheimer's and non-Alzheimer's dementia, Parkinson's disease and exacerbation multiple sclerosis. Global warming has clearly expanded the favourable conditions for the spread of zoonotic diseases outside traditional patterns, thus posing a risk of disease in new, susceptible populations [2, 6, 11, 12].

Patients with neurological disorders could be particularly severely affected by global warming. Some patients may find that their symptoms worsen: Multiple sclerosis has long been known to be affected by temperature, as are some types of epilepsy. For example, Dravet syndrome appears to be more severe in warm weather, possibly related to temperature-dependent effects on ion channels. Vector-related neurological diseases such as cerebral malaria, Zika virus, Japanese encephalitis and neurocysticercosis can be found in extensive ranges. In the most recent "Global Burden of Diseases and Risk Factors" study on stroke, suboptimal temperatures, whether hot or cold, were associated with increased risk, and air pollution in association with high temperatures was one of the first five risk factors for stroke [13].

Certain mental health conditions – example dementia, schizophrenia, as well as drug/alcohol abuse – are significant risk factors associated with an increased frequency of hospitalizations for heat-related illness, according to a global review. In Germany, the mortality of elderly people with dementia increased by 11% during heat waves compared to normal temperatures. In Italy, those suffering from depression and other mental health disorders had a significantly higher risk of dying on days around 30°C compared to 20°C. Among older adults in Rome, the risk of dying during heat waves was higher among those with mental disorders. In the UK, patients with a mental illness (psychosis, dementia, substance abuse) had a 4.8% increased risk of death for every 1°C increase in temperature above the 93rd percentile of the annual temperature distribution. One hypothesis that explains this association is the use of drugs containing diuretics and psychotropics. which, at high temperatures and especially in the elderly, have been associated with an increased risk of morbidity and mortality. An analysis of mortality and morbidity during the 2003 heat wave in France shows that the use of psychotropic drugs was associated with increased risk of hospitalisation for heat-related health problems; and that the use of antidepressants and antipsychotics was associated with an increased risk of death. In Sweden, hot weather was found to increase the risk of drug-induced hyponatraemia (a low sodium concentration in the blood), which is a known adverse side effect of common drugs such as antidepressants [9].

In the study conducted in Jinan, China in the summer of 2010, which aimed to explore the effects of heat waves on daily hospital visits for mental illness, multivariate analysis showed that heat wave events were associated with an increased risk of illness mentally. The highest odds ratios (OR) of hot flashes for daily hospital visits for mental illness were 2.231 (95% confidence interval (CI): 1.436-3.466) at a 3-day lag, 2.836 (CI 95 %: 1.776-4.525) at a 2-day lag, 3.178 (95% CI: 1.995–5.064) at a 3-day lag, and 2.988 (95% CI: 2.158–4.140) at a 2-day lag for the first, a second, third and fourth heat wave respectively. The elderly, urban residents, outdoor workers, and singles may be populations at high risk for developing heat wave-related mental illness [14].

The Epilepsy Society's director of genomics, Professor Sisodiya said: "There is clear evidence for an impact of climate on some brain conditions, particularly stroke and nervous system infections [10].

People with dementia are likely to be affected by extreme temperatures (e.g. heat illness or hypothermia) and weather events (e.g. floods or fires) because cognitive impairment may limit their ability to adapt behaviour to environmental changes [10]. In the 2020 Lancet panel on dementia, air pollution was one of three recently identified modifiable risk factors [13].

The New England, USA 10-year study (3,069,816 patients) estimated the association of dementia hospital admissions with temperature variability. During the summer months, the average increase in temperature by 1.5°C increased the risk of hospitalisation by 12%. One study analysing more than 22,000 headache visits to the emergency department showed that a 5°C increase in temperature was associated with a relative risk of headache presentation of 1.042 (95% CI 1.009–1.076) [2].

Luis Shreya et al. (2023) reviewed 24 studies relating climate to ischemic stroke incidence, with evidence of increased stroke risk in extreme temperatures. They found no consensus on the mechanism linking global warming to ischemic stroke events. Six studies showed an increase in the incidence of ischemic stroke with increasing relatively extreme temperature and humidity. These results were in contrast to 2 studies with higher stroke numbers at lower temperatures, probably because cold temperatures induce vasoconstriction and increase blood viscosity. Two studies using climate projections (mid-21st century) showed an increase in the number of years of life lost due to stroke, taking into account changes in population, fertility, greenhouse gas emissions and levels of physical inactivity [2].

Temperature variability may contribute to the increased incidence of stroke. Lin Lei et al. examined more than 140,000 first-time strokes in Shenzhen, China, and attributed 2 to 4% of strokes to a high temperature range – 5.5–8°C in a 24-hour period [15].

In recognition of the potential importance of climate change for neurology, the draft WHO Intersectoral Global Action Plan on Epilepsy and Other Neurological Disorders contains a section on reducing environmental risks, which

includes the effects of climate change, global warming and air pollution on brain health. In response to the specific challenges faced by people with epilepsy, a group of health professionals led by Sanjay Sisodiya (University College London, UK) established Epilepsy Climate Change (EpiCC), an international initiative that aims "to advance research, to share knowledge, disseminate information and promote practices that reduce contributions to climate change and help mitigate the effects of global warming for people with epilepsy." On November 25, 2021, they held the first "Changing Epilepsy" conference, this virtual meeting covered the potential effects on patients, as well as what healthcare providers, researchers and the pharmaceutical industry could do to limit these effects. EpiCC also has ongoing research projects to better understand the effects of temperature on people with epilepsy [13].

Unstable weather, temperature change of 5°C during 48 hours, in some patients with epilepsy is associated with a seasonal difference in seizure frequency. Recent studies have shown an association of temperature and various air pollutants with more visits to the neurologist of epilepsy patients during the colder winter months [2].

Experiencing major "negative" emotions such as worry, guilt, and hopelessness in anticipation of climate change has been identified with the term ecological anxiety [16]. The knowledge of changing environmental conditions and the associated mental distress they cause and that these problems will worsen with rising temperatures manifests as environmental anxiety or solastalgia. Simply put, eco-anxiety is a specific form of anxiety related to stress or distress caused by environmental change and human knowledge of it. There is no specific diagnosis of "environmental anxiety". Self-reported presentations may include panic attacks, insomnia, obsessive thinking, and/or changes in appetite caused by environmental concerns [17]. The concept of climate anxiety is an additional, potentially weighting influence: many brain conditions are associated with a higher risk of psychiatric disorders, including anxiety, and such multimorbidities may further complicate the impacts of global warming and the adaptations needed to maintain health [10].

Scientific evidence confirms that children also experience affective responses and eco-anxiety in response to awareness of global warming. Young people from vulnerable communities are often identified as emotionally impaired. Children and youth experience environmental anxiety, including displaying maladaptive (eg, denial) and adaptive responses (such as constructive hope, used as a positive coping mechanism). Preliminary considerations for parents, teachers and educators, mental health care providers, school systems, adults, and people in power include adding age-appropriate climate education to the school curriculum, considering youth emotions, and promoting healthy coping through empowerment [16].

The bibliographic studies carried out by Luis Shreya et al. (2023) highlighted several studies on the association of climate conditions with neuroinfectious diseases that analysed vector incidence or disease prevalence with historical geospatial climate data to establish associations between weather and infection risk. Diseases included West Nile virus, meningococcal meningitis, Japanese encephalitis virus, unspecified viral meningitis, coccidioidomycosis, etc. There have been no studies on neurohelminthic infections, although they are an important subset of neuroinfectious diseases affected by global warming [2].

Reduced risk awareness is combined with a reduced ability to seek help or mitigate potential harm [4, 10].

Given that the mental health effects of global warming associated with air pollution, such as depression, can contribute to the destabilisation of a community, offering a number of possible moves, such as government and health service intervention, and building social bonds and increasing confidence in people's own resilience, could help people and communities combat such unwanted health effects. Such a program must be supported by adequate data generation, compilation and analysis to ensure that the action plans developed are optimal and will yield the desired results [18].

All response measures in isolation are unlikely to be effective. As many people live in cities and countries facing extreme climate change as a result of increased air pollution, nowadays several countries are facing many evidence that reveal little attention from governments and people themselves to these destructive effects which will clearly be transferred to the next generation. Therefore, it is important to convey such messages to scientific communities, people, and health care providers to exchange resources along with educational interventions to combat these problems.

Joint **recommendations** to the Mental Health and Psychosocial Support service and climate change actors:

- integrating climate change considerations into mental health policies and programmes, including mental health and psychosocial support, to better prepare for and respond to the climate crisis,
- integrating Mental Health and Psychosocial Support into policies and programs dealing with climate change and health,
- building on global commitments,
- integrating multisectoral and community-based approaches to reduce vulnerabilities and address the mental health and psychosocial impacts of climate change,
- addressing the large funding gaps that exist for both mental health and responding to the health impacts of climate change [19].

Action is needed now to protect mental health

• There is growing evidence of the various mechanisms by which climate change affects mental health. Countries must dramatically accelerate their responses to climate change, including efforts to address its impact on mental health and psychosocial well-being. The systemic, global and potentially irreversible effects of the crisis have given rise to emerging concepts such as climate change anxiety, solastalgia, ecological anxiety and ecological pain. In many cases, these reactions may represent understandable and congruent responses to the crisis facing the world, and yet their impact can be significant. Although further research is

needed, the world has enough experience and evidence to guide immediate action.

• Strengthening the link between mental health and climate change is an opportunity to create a more holistic and coordinated response. Effective interventions are available and can be implemented immediately. With additional support from policymakers, researchers and climate actors, other interventions will be developed and a holistic response can be implemented.

• Given the human impact of climate change, mental health and psychosocial well-being must be a focus of climate action. There needs to be commitment both politically and financially and across all sectors to make MHPSS and climate action a priority. This is the only way to get justice for all who are affected [19].

A framework for organising the myriad ways psychiatry can contribute to addressing climate change is promoted by the acronym "CARM": collaboration, advocacy, research and mitigation. This involves working with policy makers, community organisations and other stakeholders to drive change; supporting vulnerable populations, including the mentally ill; developing better evidence from health and global warming research; and developing resilient communities to mitigate the effects of climate change. An alternative organising framework can be "WHAT": clinical, administrative, research and educational. Framework components in the Agenda for Health Professionals:

• Clinical initiatives: understanding, preventing and treating health impacts, including mental health; participate in social cohesion, facilitating community resilience and other public health initiatives.

Ways must be found to reduce the carbon footprint of psychiatric interventions by reducing waste. There is a developing literature on the use of strategies that could consider the relative carbon footprint of different psychiatric interventions. The carbon footprint of some of the effective interventions for the management of depression and chronic psychotic problems was calculated, which can be considered a relevant factor in the choice of treatments for these conditions.

• Administrative initiatives: reducing carbon use in small offices, clinics, hospitals and research facilities; participate in preparing for and responding to severe weather events and other disasters.

The issue of global warming could be put on the agenda of all departmental meetings and organised by the neurological and psychiatric field. Efforts could be launched to reduce the department's energy consumption by turning off electronic devices at the end of each day, resetting thermostats, and replacing old (incandescent) light bulbs with LED or energy efficient light bulbs. Medical practices can reduce their carbon footprint and costs by reducing and recycling waste, seeking renewable energy solutions (such as solar panels) and communicating digitally with patients. It should not be allowed to care for patients in environments where air pollution could aggravate existing diseases.

• Advocacy initiatives: denial of abuse; not investing in fossil fuels; developing and disseminating climate and health impact statements and calls to action; political leader's deliberation.

• Research initiatives: promoting projects that address key climate and mental health questions.

There are research opportunities for the global warming profession, just as research on the effectiveness of public health interventions in reducing the health impacts of global warming is lacking, little is known about interventions to support a public health approach to climate change; the evidence for the effectiveness of pharmacological prevention for post-traumatic stress disorder (a potentially serious consequence of weather disasters) should be evaluated, continuing to evaluate the effectiveness of treatments for this disorder; psychotherapies that could benefit a wider range of individuals, families and communities following natural disasters should be evaluated.

• Educational initiatives: providing professional training and incorporating relevant and timely content into all health professional curricula.

It is also necessary to update the relevant scientific findings in the complex relationship between global warming and mental health. To this end, some medical schools have attempted to provide education to students. We can open avenues for medical students and residents to specialise in the study of climate change and in particular to study psychological, psychiatric and social impacts, as well as mitigation and adaptation factors. Medical students, residents, faculty, and the broader psychiatric community should be educated about the issues at stake. To that end, medical schools might consider hiring climatologists and environmental scientists as professors. Residency programs (and medical schools, for that matter) may wonder if they need to fly in, when teleconference interviews are sufficient without putting any applicants at a disadvantage [20].

We should demonstrate by example that our profession takes climate change seriously and encourage others to look for ways to act as well.

Conclusions

1. The use of more flexible adaptation strategies, policies and measures becomes critical to mitigate the impact of global warming.

2. The studies included in the research highlighted the relationships between the exacerbation of neurological symptoms and temperature variability, neuroinfections and warming climates, and the incidence and severity of cerebrovascular diseases.

3. The literature review suggests that global warming will soon change neurological practice as it affects the morbidity and mortality of all major neurological disorders. Appropriately designed studies are urgently needed to begin addressing this issue, including an increased focus on low-income populations, which will require coordinated efforts by the entire neurological community.

4. The studies highlight three key priorities for further work: reducing the risk of neuro-infectious diseases, understanding the pathophysiology of air pollutants on the nervous system, and estimating how to improve the delivery

of neurological health care in the face of climate-related disruptions.

5. The importance of raising awareness of the risks of global warming to the brain and neurological health care, the importance of promoting global collaborative research and promoting global warming action and adaptation strategies is proven.

Bibliography

1. Brown MJ, White BP, Nicholas PK. Mental health impacts of climate change: Considerations for nurse practitioners. J Nurse Pract. 2022;18(4):359-363. doi:10.1016/j.nurpra.2021.07.013
2. Louis S, Carlson AK, Suresh A, et al. Impacts of climate change and air pollution on neurologic health, disease, and practice: A scoping review. Neurology. 2023;100:474-483. doi:10.1212/WNL.0000000000201630
3. Cianconi P, Betrò S, Janiri L. The impact of climate change on mental health: a systematic descriptive review. Front Psychiatry. 2020;74(11):1-15. doi:10.3389/fpsyt.2020.00074
4. Ruszkiewicz JA, Tinkov AA, Skalny A V., et al. Brain diseases in changing climate. Environ Res. 2019;177(August):108637. doi:10.1016/j.envres.2019.108637
5. Charlson F, Ali S, Benmarhnia T, et al. Climate change and mental health: A scoping review. Int J Environ Res Public Health. 2021;18(9). doi:10.3390/ijerph18094486
6. Amiri M, Peinkhofer C, Othman MH, de Vecchi T, Nersesjan V, Kondziella D. Global warming and neurological practice: Systematic review. PeerJ. 2021;9. doi:10.7717/peerj.11941
7. Bongioanni P, Del Carratore R, Corbianco S, et al. Climate change and neurodegenerative diseases. Environ Res. 2021;201(March):111511. doi:10.1016/j.envres.2021.111511
8. Caliga I. Impactul stresului termic asupra sănătății mintale. One Health & Risk Management. Ediție specuală:noiembrie; 2023:87.
9. European Climate and Health Observatory. Climate change impacts on mental health in Europe. 2022;(March):1-20.
10. Swanborough N. How climate change is affecting our brains. Epilepsy Society. Published 2024. https://epilepsysociety.org.uk/news/climate-change-brain-health
11. Gulcebi MI, Bartolini E, Lee O, et al. Climate change and epilepsy: Insights from clinical and basic science studies. Epilepsy Behav. 2021;116:107791. doi:10.1016/j.yebeh.2021.107791
12. Louis S, Carlson A, Suresh A, et al. Neurology in a changing climate: A scoping review. medRxiv. 2021;(285):2021.11.24.21266840.
13. Neurology and the climate emergency. Neurology. 2022;21:1.
14. Liu X, Liu H, Fan H, Liu Y, Ding G. Influence of heat waves on daily hospital visits for mental illness in Jinan, China—a case-crossover study. Int J Environ Res Public Health. 2019;16(1):6-13. doi:10.3390/ijerph16010087
15. Lei L, Bao J, Guo Y, Wang Q, Peng J, Huang C. Effects of diurnal temperature range on first-ever strokes in different seasons: A time-series study in Shenzhen, China. BMJ Open. 2020;10(11):1-8. doi:10.1136/bmjopen-2019-033571
16. Léger-Goodes T, Malboeuf-Hurtubise C, Mastine T, Généreux M, Paradis PO, Camden C. Eco-anxiety in children: A scoping review of the mental health impacts of the awareness of climate change. Front Psychol. 2022;13:1-21. doi:10.3389/fpsyg.2022.872544
17. Usher K, Durkin J, Bhullar N. Eco-anxiety: How thinking about climate change-related environmental decline is affecting our mental health. Int J Ment Health Nurs. 2019;28(6):1233-1234. doi:10.1111/inm.12673
18. Khafaie MA, Sayyah M, Rahim F. Extreme pollution, climate change, and depression. Environ Sci Pollut Res. 2019;26:22103-22105. doi:10.1007/s11356-019-05727-5
19. World Health Organization. Mental health and climate change: policy brief. WHO. 2022:1-16.
20. Coverdale J, Balon R, Beresin E V., et al. Climate change: A call to action for the psychiatric profession. Acad Psychiatry. 2018;42(3):317-323. doi:10.1007/s40596-018-0885-7

Received − 18.07.2024, accepted for publication − 31.08.2024
Corresponding author: Ana Langa, e-mail: ana.langa1917@gmail.com
Conflict of interest Statement: The authors reports no conflicts of interest in this work.
Citation: Langa A, Caliga I, Croitoru C. Povara sănătății mintale a încălzirii globale, profilaxie și adaptare [The mental health burden of global warming, prevention and adaptation]. Arta Medica. 2026;98(1):101-106.