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COMMENT

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Global call to understand intersectionality between heat exposure and perinatal mental health



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Abstract

Increasing heat events, due to human induced climate change have shown to affect vulnerable populations such as pregnant and postpartum women and their mental health. Moreover, consequences of heat events can be unevenly distributed, affecting communities with existing structural discrimination and socially and economically disadvantaged populations. The risk of perinatal depression might be higher in pregnant and postpartum women. In this commentary, we argue, based on the review of literature, that there is a quintessential need for scientific research to investigate the interlinkage between heat events and perinatal depression.

2024 was the year in which global ambient temperatures exceeded 1.5 degrees Celcius above the pre-industrial baseline for the first time, indicating that human-induced climate extremes, such as heatwaves, droughts, and floods, will continue to rise exponentially in the future [1]. Among the most vulnerable populations affected will be women during pregnancy and postpartum period, as rapid physiological changes occur during the perinatal stage. Exposure to non-optimal ambient temperature has been linked to heightened risks of preterm birth, pre-eclampsia, low weight for gestation and stillbirth [2]. However, the psychological and physiological changes have not yet been established.

Globally, an estimated 40 million women experience depressive and anxiety symptoms during pregnancy and/ or the postpartum period anually, due to social, biological

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and environmental factors [3]. In most low- and middleincome settings, health systems are unprepared to screen for these mental health conditions, as they are already strained by demands of routine perinatal care. This lack of preparedness is compounded by the lack of integrated screening and referral pathways for maternal mental health in standard care guidelines. Furthermore, the stigma surrounding affective disorders discourages many women from accessing the health care for early screening, diagnosis and treatment. The consequences of poor maternal mental health extend beyond the individual, as it has been associated with poor childhood development and low social and cognitive skills in the offspring [4, 5]. With increasing frequency and intensity of non-optimal ambient temperatures, there is likely an epidemiological link between heat exposure and perinatal depressive and anxiety symptoms, with factors such as poor sleep patterns and diminished social interactions acting as potential triggers.

In recent years, interdisciplinary research has increasingly focused on understanding the impact of heat exposure on perinatal health outcomes, however, there is limited evidence suggesting a link between high ambient



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temperature and perinatal mental health [6]. This empirical gap might represent a missing piece in understanding how heat exposure and heat stress contribute to poor birth outcomes. Given the detrimental effects on families and society, it is crucial to further explore the linkage between heat and perinatal mental health. In resourcepoor settings, the impact of high ambient temperature is particularly concerning, as housing conditions often lack insulation to prevent extreme temperatures. Combined with limited access to care during heat events as well as the unpreparedness of health facilities for heat-resilient perinatal care, these factors may exacerbate the risk for perinatal depressive and anxiety symptoms.

The urgency to investigate the interlinkage between heat exposure and perinatal mental health should include exploring the epidemiological and biological link between exposure and outcome.. These investigations should not be limited to linking mean daily ambient temperatures with perinatal mental health outcomes, and instead focus on continuous indoor and outdoor temperature exposure and humidity levels, measuring bio-physiological changes and women's mental health using a standardized tool. Additionally, understanding women's lived experiences of mental health during high ambient temperatures using different social and anthropological approaches is key, as this helps to explore their individualized experiences and support systems. Moreover, heat-resilient solutions need to be contextualized based on the care system of women and their families.

The year 2025 marks the 25th anniversaryof the unique positioning of mothers and children in the Millennium Development Goals, aiming for better care and attention. Yet, perinatal mental health was never addressed as a global development issue and continues to be overlooked in the sustainable development era. With the ecological crisis looming in, pregnant and postpartum women will be among the most vulnerable populations exposed to heat events and poor perinatal outcomes. Although the United Nations Climate Change conference (COP29) has highlighted climate financing for vulnerable regions of the globe to adapt to the effects of climate change [7], attention to these populations remains insufficient. There is a continuous need by academia to strive forward for interdisciplinary research to address and improve perinatal mental health outcomes during heat events, bridging critical gaps in healthcare and knowledge.

Author contributions

AKC and LK conceptualized the commentary. Both of them wrote the first draft and made it final together.

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Data availability

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Consent for publication

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References

- (IPCC) IPoCC: In Climate Change 2021 The Physical Science Basis: Working Group I Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. In. Edited by Press CU. Cambridge. 2021.
- Hanson C, de Bont J, Annerstedt KS, Alsina MDR, Nobile F, Roos N, Waiswa P, Pembe A, Dossou JP, Chipeta E, et al. A time-stratified, case-crossover study of heat exposure and perinatal mortality from 16 hospitals in Sub-saharan Africa. Nat Med. 2024;30(11):3106–13.
- Roddy Mitchell A, Gordon H, Lindquist A, Walker SP, Homer CSE, Middleton A, Cluver CA, Tong S, Hastie R. Prevalence of Perinatal Depression in Low- and Middle-Income countries: a systematic review and Meta-analysis. JAMA Psychiatry. 2023;80(5):425–31.
- Gelaye B, Rondon MB, Araya R, Williams MA. Epidemiology of maternal depression, risk factors, and child outcomes in low-income and middleincome countries. Lancet Psychiatry. 2016;3(10):973–82.
- Kc A, Chandna J, Acharya A, Gurung R, Andrew C, Skalkidou A. A longitudinal multi-centric cohort study assessing infant neurodevelopment delay among women with persistent postpartum depression in Nepal. BMC Med. 2024;22(1):284.
- Pardon MK, Dimmock J, Chande R, Kondracki A, Reddick B, Davis A, Athan A, Buoli M, Barkin JL. Mental health impacts of climate change and extreme weather events on mothers. Eur J Psychotraumatol. 2024;15(1):2296818.
- UN Climate Change. UN Climate Change Conference Baku November 2024. In. 2024.

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