

## Heat Stress a Risk Factor for Poor Maternal Health- Evidence from South India

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**Abstract :** Introduction: Climate change and the growing frequency of higher average temperatures and heat waves have detrimental health effects, especially for certain vulnerable groups with limited socioeconomic status (SES) or physiological capacity to adapt to or endure high temperatures. Little research has been conducted on the effects of heat stress on pregnant women and fetuses in tropical regions such as India. Very high ambient temperatures may worsen Adverse Pregnancy Outcomes (APOs) and are a major worry in the scenario of climate change. The relationship between rising temperatures and APO must be better understood in order to design more effective interventions. Methodology: We conducted an observational cohort study involving 865 pregnant women in various districts of Tamil Nadu districts between 2014 and 2021. Physiological Heat Strain Indicators (HSI) such as morning and evening Core Body Temperature (CBT) and Urine Specific Gravity (USG) were monitored using an infrared thermometer and refractometer, respectively. A validated, modified version of the HOTHAPS questionnaire was utilised to collect self-reported health symptoms. A follow-up was undertaken with the mothers to collect information regarding birth outcomes and APOs, such as spontaneous abortions, stillbirths, Preterm Birth (PTB), birth abnormalities, and Low Birth Weight (LBW). Major findings of the study: According to the findings of our study, ambient temperatures (mean WBGT°C) were substantially higher (>28°C) for approximately 46% of women performing moderate daily life activities. 82% versus 43% of these women experienced dehydration and heat-related complaints. 34% of women had USG >1.020, which is symptomatic of dehydration. APOs, which include spontaneous abortions, were prevalent at 2.2%, stillbirth/preterm birth/birth abnormalities were prevalent at 2.2%, and low birth weight was prevalent at 16.3%. With exposures to WBGT>28°C, the incidence of miscarriage or unexpected abortion rose by approximately 2.7 times (95% CI: 1.1-6.9). In addition, higher WBGT exposures were associated with a 1.4-fold increased risk of unfavorable birth outcomes (95% Confidence Interval [CI]: 1.02-1.09). The risk of spontaneous abortions was 2.8 times higher among women who conceived during the hotter months (February - September) compared to those women who conceived in the cooler months (October - January) (95% CI: 1.04-7.4). Positive relationships between ambient heat and APOs found in this study necessitate further exploration into the underlying factors for extensive cohort studies to generate information to enable the formulation of policies that can effectively protect these women against excessive heat stress for enhanced maternal and fetal health.

**Keywords :** heat exposures, community, pregnant women, physiological strain, adverse outcome, interventions

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