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Investigating the relationship between outdoor heat events upon sleep quality in Ankara

Merve Ahan and Andre Nouri

Department of Interior Architecture and Environmental Design, Faculty of Art, Design and Architecture, Bilkent University, 06800 Bilkent, Ankara, Turkey

Within the existing literature, it is well established that thermal comfort thresholds play an integral part in sleep quality. For this reason and within consolidated urban environments that are continually witnessing increased vulnerability to heat stress as a result of urban densification and climate change, impediments upon sleep quality due to excess physiological heat stress is a growing concern. Such risk factors are particularly the case for older traditional building methods that depend on natural ventilation.

Focused upon the capital city of Ankara, and through the application and modification of the WMO's Expert Team on Climate Change Detection Monitoring Indices (ETCCDMI) to determine the effects of sleep quality during different heat stress events, three different conditions were respectively examined, during a: (1) typical summer day; (2) very hot day; and lastly, (3) heat wave event. Within this case study, the relationship between the indoor thermal thresholds and sleep quality shall be undertaken through the use of: (i) the Physiologically Equivalent Temperature (PET) calculated from climatic variables retrieved from the residential units at a 10 minute temporal resolution; (ii) questionnaires to acquire qualitative responses from local residents; and, (iii) local urban climatic data, retrieved from Ankara's meteorological station (#17130) at an hourly temporal resolution.

The outputs of the study address the growing need to identify and address the impact that urban augmenting temperatures have upon the sleep quality of occupants in more vulnerable construction typologies. Given that such vulnerabilities in urban settings are continually observing more frequent and intense heatwaves and hot days, the study highlights the need to strengthen the understanding between such outdoor events and sleep quality patterns in warming urban frameworks.