

Overview

Construction workers are frequently exposed to extreme environmental conditions, often working outdoors being exposed to solar radiation or in enclosed spaces with limited airflow. Previous studies have shown that construction workers have a 13 times higher risk of heat-related death than workers from other sectors: although they constitute only 6% of the total workforce, they accounted for 36% of all occupational heat-related deaths from 1992 to 2016. There is a need in the United States for research which quantifies overall heat exposure and heat strain among construction workers. No study to date has measured heat strain via core temperature, even though it is one of the most common markers of this condition. To assess heat strain and environmental heat stress among construction workers, the researchers calculated metabolic rate and measured core body temperature and hydration status of workers pre- and post-shift at both a commercial building construction site and a road construction site.

Key Findings

- In commercial building construction, even in environmental conditions of low to moderate heat stress, workers experience significant heat strain, primarily associated with changes in peak metabolic rate. Workers in uncovered areas have the highest increase in core temperature even under moderate heat stress.
- Environmental heat exposure and metabolic rate vary by job type and work environment.
- In road construction, workers experience significant heat strain, elevating their risk for heat-related illnesses.
- Most workers arrived at the job site dehydrated.
- Workers had small reductions in body weight during the work shift, indicating that hydration status was maintained.
- Although water was available to workers during their shift and they were not further dehydrated during work, employers should encourage their workers to hydrate themselves before arriving at the job site.

For more information, contact:

Fabiano Amorim: amorim@unm.edu

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