

cohort studies, and strong evidence to design robust policies to protect pregnant women from heat stress risks in developing countries for improved reproductive health.

0-371 OCCUPATIONAL HEAT EXPOSURES AND RENAL HEALTH IMPLICATIONS – A CROSS-SECTIONAL STUDY AMONG COMMERCIAL KITCHEN WORKERS IN SOUTH INDIA

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Introduction Strenuous jobs in hot working environments, such as in commercial kitchens, are proven risk factors for adverse renal implications for workers working without adequate interventions. Evidence is scarce on the heat exposures and their impacts on commercial kitchen workers' renal health.

Objectives To investigate the renal health implications due to the workers' exposures to heat stress and exertion in commercial kitchens.

Methods We conducted a cross-sectional study among 266 workers in 7-commercial kitchens in the summer and winter of 2018. We monitored the Wet Bulb Globe Temperatures (WBGT), the physiological indicators of heat strain viz., rise in Core Body Temperature (CBT), Sweat Rate (SwR), and Urine specific gravity (USG) and analyzed the post-shift serum creatinine to calculate the estimated Glomerular Filtration Rate (eGFR). We administered a validated questionnaire to capture the workers' self-reported renal health symptoms of heat stress.

Results About 66% of workers were exposed to WBGTs levels higher than the safer Threshold Limit Value (TLV) with an average exposure of $30.1^{\circ}\text{C} \pm 2.7^{\circ}\text{C}$. Among the exposed workers, 82% reported experiencing heat strain symptoms such as excessive sweating, exhaustion, headache irrespective of the season. Above TLV-WBGT exposures were significantly associated with self-reported symptoms of dehydration (Adjusted Odds Ratio (AOR):2.3; 95% CI:1.2–4.3) and measured heat strain indicators (AOR: 2.9; 95% CI:1.6–5.1). Prevalence of heat strain indicators viz., rise in CBT (9.1%), SwR (17%), USG (75%), was observed among heat-exposed workers. Heat-exposed workers had a 2.8-fold higher risk of reduced kidney function (eGFR of $< 90 \text{ mL/min/1.73 m}^2$) even after adjusting for the potential confounders (AOR:2.8; 95% CI:1.1–6.9).

Conclusion The preliminary study results show adverse renal impacts of heat exposures among commercial kitchen workers that warrant further investigation to arrive at conclusive results. A need for adaptation and interventions is imperative to protect few million kitchen workers from hazards of occupational heat stress.

0-418 OCCUPATIONAL HEAT EXPOSURES, PHYSIOLOGICAL RESPONSES AND RENAL HEALTH OUTCOMES AMONG BRICK WORKERS IN SOUTH INDIA

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Introduction Rising temperature with consequent heat stress is likely to subject millions of workers exerting outdoors at risk of heat-related illnesses and adverse renal health outcomes. Need for such research evidence is urgently needed to address this issue especially in the changing climate scenario.

Objective To investigate the relationship between occupational heat stress, physiological indicators of heat strain, and associated renal health outcomes among brick workers in South India.

Methods We conducted a cross-sectional survey with 327 brick workers during the summer of 2017 & 2018. We collected Wet Bulb Globe Temperatures (WBGT $^{\circ}\text{C}$), pre-and post-shift Core Body Temperature (CBT), Urine Specific Gravity (USG), and post-shift Sweat rate (SwR), and serum creatinine/uric acid for calculating eGFR (estimated Glomerular Filtration Rate), a kidney function indicator.

Results Workers were exposed to an average WBGT of $27.7^{\circ}\text{C} \pm 2.2$ with more than 51% of measurements above the ACGIH-Threshold Limit Value (TLV). 69% of the workers reported heat-strain symptoms such as excessive sweating, exhaustion, and headaches. The workers exposed to above TLV-WBGT had 1.8-fold higher risk of dehydration (Adjusted Odds Ratio (AOR):1.8; 95%CI: 1.0–3.0, $p=0.03$), rise in CBT (AOR=2.2, CI: 1.0–4.7, $p=0.02$) and measured heat-related symptoms (AOR=2.5, 95%CI: 1.5–4.2, $p=0.0001$). Heat-exposed workers had CBT $>1^{\circ}\text{C}$ (14%), SwR $>1\text{lit/hr}$ (24%), and USG >1.020 (35%). The prevalence of low eGFR (; 95%CI: 1.6–4.2) compared to workers exposed to WBGT below TLV.

Conclusion The preliminary study results only give a clue to the impacts of occupational heat stress on renal health. To have conclusive results, further epidemiological investigations are warranted with stratification for various personal and exposure factors that determine the disease etiology. With or without evidence, the drive for precautionary protective labor policies/welfare measures does not diminish for better occupational health outcomes.

0-427 RISK FACTORS FOR ELEVATED CORE BODY TEMPERATURE IN FARMWORKERS

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Introduction Heat-related illness (HRI) poses a serious occupational health risk for farmworkers, particularly considering harvest season corresponds to peak summertime heat. The California Heat Illness Prevention Study (CHIPS) collected objective data on the physiological responses of farmworkers to environmental heat, covering a wide range of crops and working conditions.

Objectives The primary objective of this analysis is to identify risk factors for elevated core body temperature (CBT).

Methods A convenience sample of farmworkers was recruited through farms and farm labor contractors. Bilingual researchers administered questionnaires pre- and post-shift. CBT and work rate were measured using an ingestible wireless thermistor and an accelerometer, respectively. Ambient weather conditions, including wet bulb globe temperature (WBGT), were recorded using two weather stations at the work site. Multiple

logistic modeling was used to identify risk factors for elevated CBT ($\geq 38.5^{\circ}\text{C}$).

Results In total, 587 farmworkers on 30 farms throughout California participated over the summers of 2014 and 2015. After data cleaning, 507 participants were included in analyses using elevated CBT as the primary outcome. In multiple logistic modeling (AOR [95% CI]) male sex (3.74 [1.22 – 11.54]), WBGT (1.22 [1.08 – 1.38]), work rate (1.004 [1.002 – 1.006]), and increased BMI (1.11 [1.10 – 1.29]) were all independently associated with elevated CBT.

Conclusion Despite high summer temperatures, most farmworkers were able to keep their CBT below 38.5°C . Risk of HRI was exacerbated by work rate and environmental temperature despite farms following Cal/OSHA regulations.

Injuries

0-11 DIFFERENCE IN THE DEATHS OF DESPAIR BY OCCUPATION, MASSACHUSETTS, 2000–2015

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Objective To determine differences in mortality rates and trends according to the occupation of workers who died from the ‘deaths of despair’ (DoD).

Methods Death certificates for deaths due to poisonings (including opioid-related overdoses), suicides, and alcoholic liver disease occurring in Massachusetts from 2000 to 2015 were collected and coded according to the occupation of the decedent. Mortality rates and trends in mortality were calculated for each occupation. We also examined possible underlying causes of differences by occupation in rates of DoD by investigating the relationship between occupational injuries and DoD using data from the U.S. Bureau of Labor Statistics.

Results DoDs increased by more than 50% from 32.5 deaths per 100,000 workers in 2000–2004 to 49.6 in 2011–2015. Deaths increased in all three cause categories, but opioid-related deaths increased most rapidly. There were substantial differences in mortality rates and trends according to occupation. There were particularly elevated risks for blue collar, notably: construction; farming, fishing, and forestry; installation, maintenance, and repair; transportation and material moving; building and grounds cleaning and maintenance; production; and healthcare support workers. Most of these occupations not only had higher than average rates of death, but these rates also increased more rapidly over the 16 year period. As hypothesized, occupations with high injury rates also suffered from high DoD mortality rates. Compared to occupations in the lowest quartile of injuries (< 40 per 10,000 full-time workers), those in the high quartile (> 199 per 10,000 full-time workers) had nearly 4 times higher rates of DoD.

Conclusions These findings suggest that work may be a factor contributing to DoD. Interventions should be targeted to the needs of workers with elevated mortality rates and trends for the deaths of despair. Further work is needed to identify preventable risk factors for these outcomes that may be contributing to these.

0-12 WORKPLACE WELLNESS PROGRAM INTEREST, PARTICIPATION BARRIERS, AND ASSOCIATIONS WITH SOCIODEMOGRAPHICS, HEALTH STATUS, AND WORKPLACE FACTORS: A SURVEY OF WORKERS WITH WORK-RELATED PERMANENT IMPAIRMENTS

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Introduction Injured workers with work-related permanent impairments—who account for roughly 10% of all injured workers—face elevated risks of reinjury and return-to-work (RTW) interruption related to health, disability, and workplace factors. Nearly half of United States workers have access to workplace wellness programs (WWPs), which hold potential to improve health and employment outcomes, yet only 58% of workers with access choose to participate. Equitable access for workers with permanent impairments is crucial, but interest levels and barriers are unknown.

Objectives To assess interest in WWP participation among injured workers who have RTW with a permanent impairment; to assess associations with sociodemographics, health status, and workplace factors; and to describe self-reported participation barriers and reasons for expressing lack of interest.

Methods Workers who had RTW after a work-related injury involving permanent impairment were interviewed about a year after workers’ compensation claim closure. Workers were queried regarding interest in potential WWP participation; if they expressed no interest, they were asked, ‘Why is that?’ Qualitative content analysis methods were used to inductively code open-ended responses.

Results Of 560 respondents, 51.4% expressed interest in WWP participation, and 48.6% were not interested. Expressing interest was significantly associated with more adverse: health status, work function, pain, perceived reinjury risk, job security, missed work days, and earnings. Workers expressing interest were less likely to have health insurance, and more likely to have certain chronic health conditions. Among those not interested (N=272), reasons included: not needed (21.0%), have own fitness/wellness programs (18.38%), wouldn’t be helpful (6.25%). Barriers included: too busy, commute, work schedules, age/health/injury status, privacy. Few workers (1.47%) expressed negative perceptions of WWPs.

Conclusion Most workers with permanent impairments—particularly those at higher risk of adverse health outcomes—are interested in participating in WWPs. Interest among this high-risk population might expand if participation barriers are addressed.

0-35 OCCUPATIONAL INJURIES AND HAZARD EXPOSURES AMONG SMALL-SCALE MINERS IN THE PHILIPPINES

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Objectives This study investigated the ergonomic and safety hazards of small-scale miners in one of the largest small-scale