Healthcare Innovations
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HERSTON HEALTH PRECINCT SYMPOSIUM 2021

CLIN-0054

6 - 10 September 2021
Education Centre
RBWH

# Fatigue associated with personal protective equipment and patient care in a high-risk isolation area of the ED

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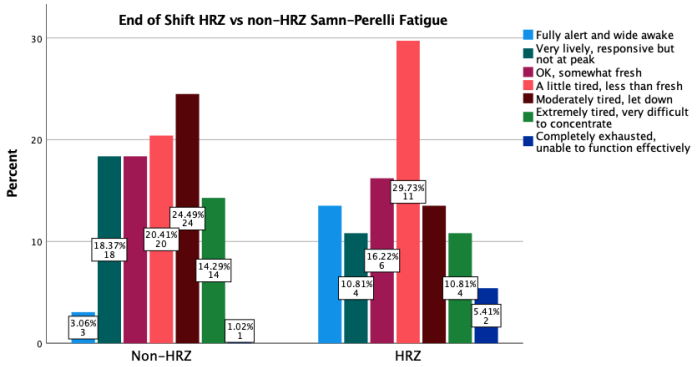
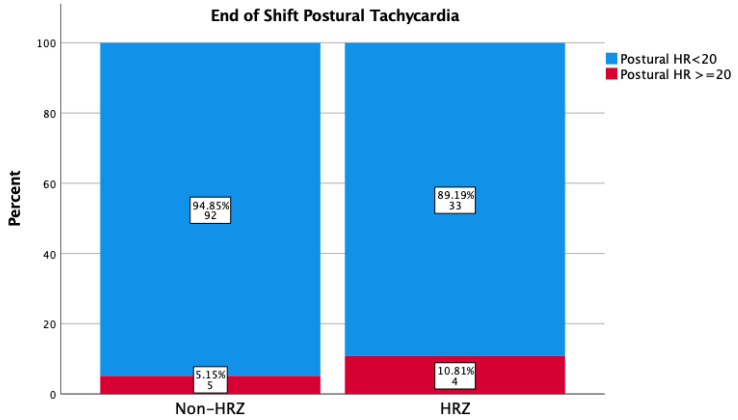
**Purpose**: Emergency Department (ED) patients with COVID-19 symptoms are treated in a high-risk zone (HRZ) where clinicians are donned in personal protective equipment (PPE). Our aim was to determine the effects on clinician cognitive function after shifts in a HRZ compared with other ED areas.

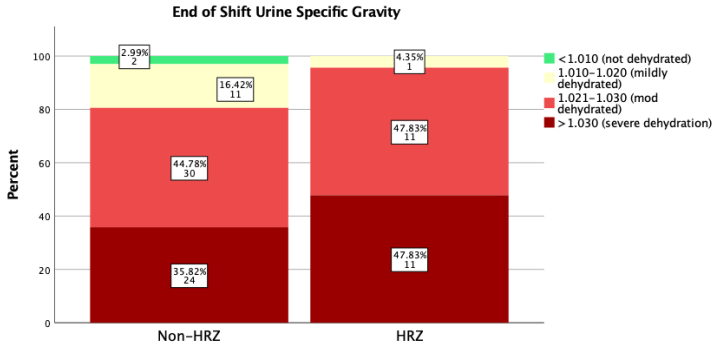
**Methods**: Quasi-experimental study at RBWH ED. ED doctors and nurses were recruited from HRZ and non-HRZs (Acute/Resus/Fast Tract/Short-Stay Unit). *Outcomes*: Fatigue was measured before and after a shift objectively with a psychomotor vigilance task using the validated Whack-A-Mole (WAM) electronic game, and subjectively using the Samn-Perelli 7-point fatigue scale. Participants could repeat data collection in different shifts in the same or different locations. Postural symptoms (lightheadness on standing or postural increase in pulse ≥20bpm) and urine specific gravity (SG) were measured.




**Results**: There were 61 participants with a median (IQR) age of 34 (28-39) years, 77% were female. Of the 258 shifts, 67 (26%) were in the HRZ. The median (IQR) end-of-shift WAM scores for HRZ and non-HRZ were 620 (590-670) and 630 (600-670) respectively. End-of-shift scores were lower than beginning of shift in 69.0% of HRZ vs 51.2% in non-HRZ. At the end of a shift, 59.5% of HRZ participants were feeling tired (Samn-Perelli scale 4-7) vs 60.2% of non-HRZ.
There was minimal difference between groups with regard to end of shift postural symptoms 27.0% vs 29.9% for HRZ and non-HRZ respectively, however a higher proportion of HRZ participants had a postural tachycardia at end of shift.




**Key**: HRZ = high-risk zone, ED = Emergency Department, WAM = Whack-a-mole




A higher proportion of HRZ participants had a urine SG>1.020, (95.7% vs 80.6% for HRZ and non-HRZ respectively) with 47.8% of HRZ participants being severely dehydrated. Participants, who had a decrease in urine SG over the shift, were more likely to have better or unchanged WAM scores than with those with unchanged or higher SG (71% vs 41%, p=0.03). Participants whose fatigue increased, had a higher proportion of lower WAM scores (61% vs 44%) but this was not statistically significant p=0.07)

**Conclusions**: The preliminary findings suggest working a shift in the HRZ could be associated with a decline in cognitive function compared to working in the non-HRZ areas. Physiological stressors such as dehydration and fatigue may be contributing factors.

*This research was supported by a grant from the Emergency Medicine Foundation (Australasia) Queensland Program (EMLE-165R34-2020) and a COVID-19 Research Project Grant from the RBWH Foundation Coronavirus Action Fund*