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HOW A LACK OF SLEEP ON THE FIRE GROUND MAY BE IMPACTING FIREFIGHTERS' PHYSIOLOGICAL STRESS RESPONSE

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Background

Two common fire ground stressors include;

- **Physical Work**: 12 to 15 h shifts [1, 2]
- **Sleep Restriction**: 4 h sleep between shifts [1]

- Individually, **physical work** and **sleep restriction** can trigger a change in **cortisol** – the major stress hormone [3, 4]
- Altered **cortiso**l responses have been associated with negative physical (e.g., CVD) & psychological (e.g., depression) health outcomes [5, 6]
- However, how **physical work** & **sleep restriction** in combination impact on firefighters **cortisol** response is not currently known

Aim: To investigate the effect sleep restriction has on firefighters cortisol responses during a simulated fire ground deployment

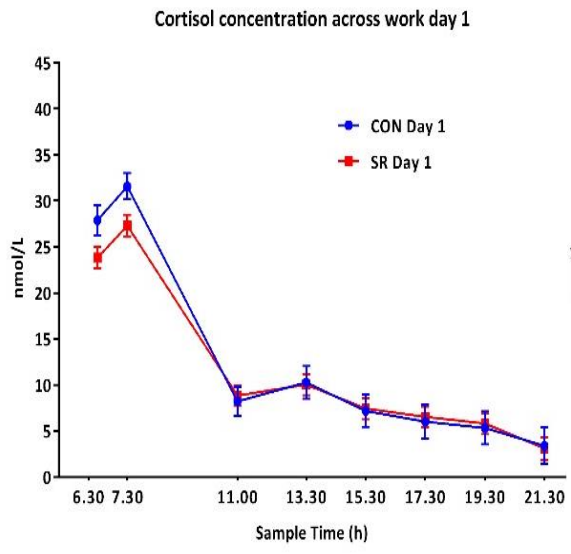
Methods

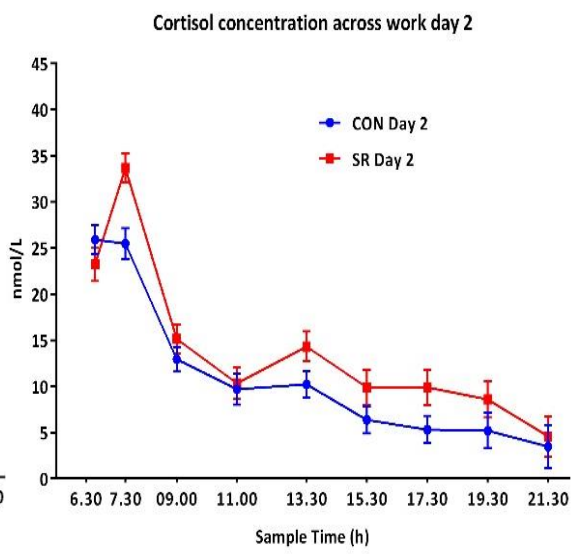
Australian firefighters (n = 35) recruited to;

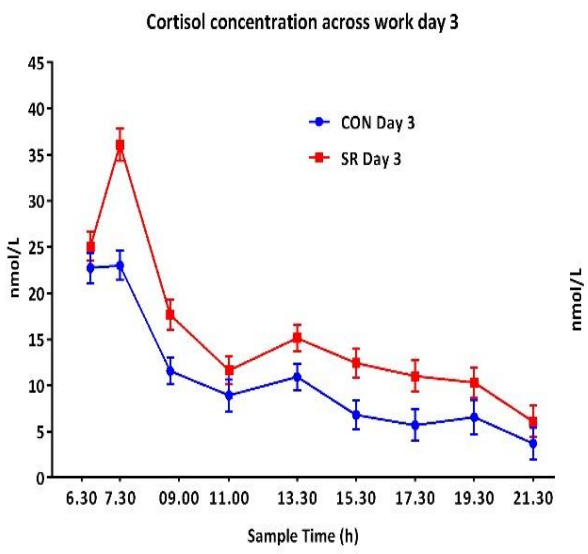
- Control Condition (CON; n = 18): 8 h sleep each night
- Sleep restriction Condition (SR; n = 17): 4 h sleep each night
- All participants completed a 3-day & 2-night simulated fire ground tour comprising intermittent physical work
- Measured salivary cortisol multiple times each day (i.e., 8 to 9 sampling points)

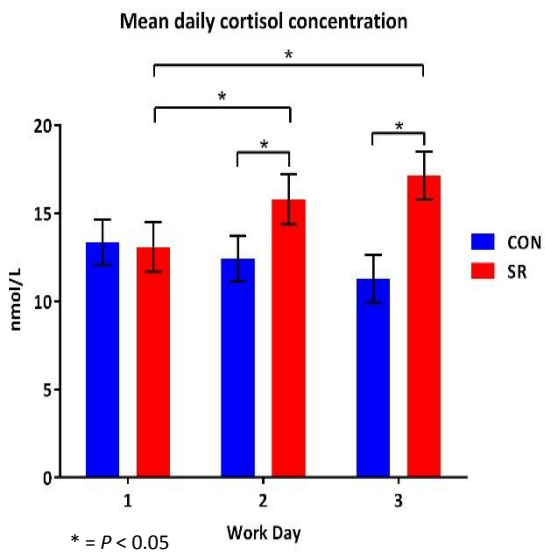
Results

- Change in cortisol levels over the three days was greater in the SR condition compared to CON condition ($P < 0.05$)
- Increase in mean daily cortisol levels for SR condition ($P < 0.05$)
- Cortisol levels in the SR condition were above the normal reference range for adults









Conclusion & Industry Implications

- Sleep restriction & firefighting work resulted in higher cortisol levels
- In addition to firm evidence supporting the importance of a 7 to 9-h sleep in maintaining cognitive function[7], findings from the current study demonstrate the protective role an 8-h sleep opportunity between shifts of firefighting work may have on preserving cortisol levels

Future Areas of Research

Determine how;

- Cortisol levels recover following firefighting work & restricted sleep
- Longer/chronic exposure to firefighting & restricted sleep (e.g., over a fire season or career) affects cortisol

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