THE INTERACTIONS OF PHYSICAL WORK, SLEEP DEPRIVATION AND STRESS RESPONSES

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Overview:
• Firefighters are exposed to various work demands, including:
  • Physical work 1
  • Sleep deprivation 1

• Work demands can elicit physiological and psychological stress responses 2

• Individually, physical work and sleep deprivation can induce adverse stress responses, including:
  ✓ Depressed mood 3
  ✓ Sickness behaviours 4
  ✓ Weakened immune system 2, 4, 5

• No research has investigated the combined effect physical work and sleep deprivation has on firefighters’ stress responses

• Understanding the combined effect of work demands on firefighters’ stress is a priority for fire agencies world wide

Proposed Methods:
• Firefighters will participate in:
  • Control condition (i.e. no work and ‘normal’ sleep opportunity)
  • 4-day firefighting work simulation (i.e. ‘normal’ sleep opportunities between shifts)
  • Extended wakefulness condition (i.e. 4-day work simulation with shortened sleep opportunities between shifts)

• Stress responses will be measured during each condition using:
  • Biological markers (e.g. Cortisol and Cytokines)
  • Questionnaires

Specific Research Questions:
• What are firefighters stress responses (e.g. changes in mood, behaviour and immune function) during and following simulated firefighting work compared to control conditions?

• Do firefighters stress responses to repeated bouts of physical firefighting work performed over a single shift differ significantly to their stress responses following consecutive shifts?

• Do shortened sleep opportunities between work shifts affect firefighters stress responses across consecutive shifts of firefighting work?

Industry Implications:
• Previous research in other services have reported greater immune, behavioural and mood disturbances in response to demanding work 2, 4, 6

• This research will:
  • Provide fire agencies with their first insight into the possible effects extended fire ground deployment has on firefighters’ stress responses
  • Determine if agencies need to take further action to protect firefighters from adverse physiological and psychological stress responses