

HOW DOES SHORT SLEEP IMPACT FIREFIGHTERS' PHYSICAL WORK?



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THE AIM OF THIS RESEARCH WAS TO EXAMINE THE RELATIONSHIP BETWEEN FIREFIGHTERS' SLEEP, PHYSICAL ACTIVITY, AND PHYSICAL TASK PERFORMANCE DURING REAL AND SIMULATED BUSHFIRE SUPPRESSION.

Methods

Data were collected in two stages: a) Study 1 & 2 - real bushfire suppression (field) and b) Study 3 - simulated bushfire suppression (laboratory). **Field:** 40 firefighters physical activity and sleep was measured for 4 consecutive weeks. Relationships between physical activity and sleep were explored. **Laboratory:** 35 firefighters were assigned to either a control condition (8-h sleep opportunity, n=18) or a sleep restricted condition (4-h, n=17), and performed a 3-day work simulation, which assessed how restricted sleep impacted firefighters' performance on work tasks and their physical activity.

Results

During real bushfire suppression, although firefighters reported multiple stressors that compromised sleep (Figure 1), no significant effects of sleep duration (3.1–8.2 h) on physical activity were observed. During the laboratory simulation there was no differences in physical task performance between the two groups. However, participants in the sleep-restricted group were less physically active during periods of non-physical work compared to the control group.

Discussion

The adverse impacts of sleep restriction may depend on the type of tasks being performed not just the amount of sleep workers are getting. Frequent task rotation and teamwork may have enabled firefighters to maintain physical task performance despite being sleep restricted. During the work task simulation, reduced activity in rest breaks may also have enabled firefighters to maintain physical task performance. Agencies and researchers should investigate whether informal strategies such as task rotation, teamwork, and intermittent breaks, allow firefighters to maintain task physical performance despite shortened sleep.

Publications arising from this work (full text of all articles are available using the RG link below):

1. Vincent, Aisbett, Hall, Ferguson. (2015). Fighting fire and fatigue: sleep quantity and quality during multi-day wildfire suppression, *Ergonomics*, 1–24.
2. Vincent, Ferguson, Tran, Larsen, Wolkow, Aisbett. (2015). Sleep restriction during simulated wildfire suppression: effect on physical task performance, *PLoS One*, Volume 10 (1): e0115329.
3. Vincent, Ferguson, Ridgers, Aisbett. (2016). Associations between firefighters' physical activity across multiple shifts of wildfire suppression, *Ergonomics*, 1–20.

SLEEPING DURING BUSHFIRE SUPPRESSION IS **EXTREMELY DIFFICULT**. THE HOURS ARE **LONG**, THE TURNAROUND BETWEEN SHIFTS IS **QUICK**, AND YOU ARE **WIRED** FROM THE DAY'S WORK.

(AUSTRALIAN FIREFIGHTER)



FIGURE 1. Stressors that compromise sleep during bushfire operations

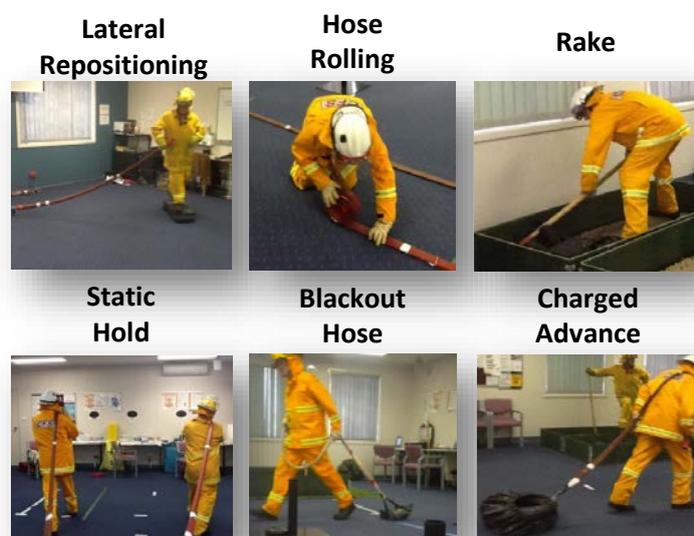


FIGURE 2. Physical tasks performed during simulated bushfire suppression

