sion, and sleepiness, caffeine intake, physical activity, work condition, and support based on self-report questionnaire. Multivariable logistic regression model was conducted to estimates odds ratios (OR) and its corresponding 95% confidence interval (95% CI).

Results: The proportions of poor sleep quality (global PSQI scores > 5), sleepiness (ESS scores ≥10), and self-reported trouble falling sleep were 45.8%, 31.1%, and 27%, respectively. Short sleep duration of < 8 hours (OR: 7.34, 95% CI: 1.84 - 29.35) trouble falling sleep at bedtime (OR: 18.05, 95% CI: 2.97 - 109.64), and fatigue (OR: 1.57, 95% CI: 1.00 - 2.46) were significant predictors of poor sleep quality after adjusting for other covariates.

Conclusion: Sleep problems among young, healthy, Taiwanese active-duty Air Force cadets are common. Our study findings have significant implications for the health and safety concerns for Air Force cadets in Taiwan. A prospective cohort study with larger sample size is warranted to further investigate the correlates of poor sleep among active-duty Air Force cadets.

0191
SLEEP QUANTITY AND QUALITY IS NOT COMPROMISED DURING PLANNED BURN SHIFTS < 12 H
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Introduction: Planned burning is a preventative strategy aimed at decreasing fuel loads to reduce the severity of future wildfire events. During planned burn operations firefighters can work long shifts and may be required to sleep away from home between shifts. The existing evidence surrounding firefighters’ sleep during such operations is exclusively anecdotal. The aims of the study were to describe firefighters’ sleep during planned burn operations and evaluate the impact of the key operational factors (shift start time, shift length and sleeping location) that may contribute to inadequate sleep.

Methods: Thirty-three firefighters were recruited from Australia’s fire agencies and sleep was measured objectively using wrist actigraphy for four weeks. All variables were examined in two conditions: 1) burn days, and 2) non burn days. Time in bed, total sleep time, sleep latency, and sleep efficiency were evaluated objectively. Subjective reports of pre- and post-sleep fatigue, sleep location, sleep quality, sleep quantity, number of times woken and sleep timing were also recorded.

Results: Analyses revealed no differences in measures of sleep quantity and quality when comparing non burn and burn days. Total sleep time was less when planned burn shifts were greater than 12 h. However, on burn days, work shift start time as well as sleeping location did not impact firefighters’ sleep quantity. Self-reported levels of pre- and post-sleep fatigue were greater on burn days compared to non burn days.

Conclusion: Collectively, the findings of the current study are positive for fire agencies as firefighters’ sleep does not appear to be compromised between day shift planned burn operations, unless shifts are greater than 12 h. Future work should focus on developing a more comprehensive measure of fatigue that can be implemented during firefighting operations as well as investigating the impact of night-shift work on firefighters’ sleep.

0192
PILOTS’ SELF-REPORTED FATIGUE MANAGEMENT ON LONG-RANGE AND ULTRA-LONG-RANGE ROUTES
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Introduction: Fatigue risk is inherent to long haul flight operations, which involve long duty periods and transmeridian flights. Pilots operating such long-haul flights often experience periods of extended wakefulness and sleep loss. Although the use of in-flight rest is the primary recommended fatigue countermeasure, information about other fatigue countermeasures used by pilots is mainly anecdotal. The present analyses aimed to identify how pilots manage their fatigue during these flights.

Methods: Duty diary data collected as part of five prior studies of pilot sleep on different routes was combined and responses to a question relating to how they managed fatigue on each flight segment were extracted. Accepted methods of thematic analysis were applied to these responses.

Results: A total of 629 responses were included in these analyses. Fatigue management strategies did not appear to be linked to the type of flight (long range vs. ultra-long range). The main method of managing fatigue was the use of the allocated in-flight rest opportunities, although the organisation of these breaks varied by route and fleet. Pilots described different flight preparation techniques which were aimed either at maximising sleep pre-flight (e.g. taking a nap) or at maximising sleepiness prior to the flight (e.g. shortening sleep pre-flight). These practices were frequently linked to planning for a specific in-flight rest break. Pilots also reported techniques used to increase their alertness in-flight (e.g. coffee, exercise) and strategies to improve their in-flight sleep (e.g. avoiding caffeine, relaxing).

Conclusion: The fatigue management techniques reported imply that pilots make use of in-flight rest opportunities which aligns with current recommendations when additional pilots are on board (augmented crews). However, responses indicated that flight preparation was another important fatigue management strategy, which highlights the importance of pilots knowing the pattern of in-flight rest breaks well ahead of the flight.

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0193
REPORTED SLEEP PROBLEMS AND PRACTICES IN ACTIVE DUTY MILITARY MEMBERS DURING DEPLOYMENT
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Introduction: Members of the military are plagued by sleep challenges often resulting in chronic sleep deprivation and elevated fatigue. This study assessed a) the prevalence of sleep-related problems in a sample of active-duty military members, and b) the effect of interventions designed to improve sleep hygiene (e.g., sleep education, use of melatonin, improving shift schedules).

Methods: Completed between 2012 and 2015, the annual survey (4,653 respondents; 69% between 19 and 25 years old; ~80% response rate) covered shiftwork practices, sleep quantity/quality, sleeping conditions, prevalence of sleep problems and sleep paralysis, and personal sleep-related habits and behaviors, such as caffeine intake, activities before bedtime, etc.
Results: Over the four-year period, approximately 58% of the respondents reported receiving ≤ 6 hours of daily sleep, with six hours being the most frequent response (35%). To improve their sleep, respondents reported using blackout shades (48%), engaging in an activity to get tired (physical workouts 47%), taking melatonin (21%), or using alcohol (15%). Overall, 49% of respondents relied on pharmacological interventions to improve their sleep (e.g., melatonin, prescription drugs or over-the-counter medications). Respondents reported that effective sleep aids included using alcohol, blackout shades, pharmacological interventions, and white noise machines. Nearly half of respondents reported having trouble staying asleep (48%), followed by oversleeping (26%), sleep paralysis (26%) and experiencing bad dreams (24%). Participants reporting seven, or more, hour of sleep decreased from 34% in 2012 to 45% in 2015 (p < 0.001), whereas melatonin use increased from 10.3% in 2012 to 29.6% in 2015 (p < 0.001).

Conclusion: Preliminary results showed that sleep education and the promotion of healthy sleep-related practices improved reported sleep and was associated with increased melatonin use. However, further education should emphasize the potentially negative impact of questionable practices (e.g., physical workouts before sleep, use of alcohol).

0194
TIRED COPS: THE IMPACT OF FATIGUE ON TACTICAL SOCIAL INTERACTION IN POLICING
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Introduction: Chronic fatigue due to shift work, long work hours, and sleep disruption is pervasive among police. On the streets, officers who are tired are less in control of their emotions, and are less likely to interact with people in ways that build trust in police. This abstract presents results from a groundbreaking three-year experimental study of the effects of shift-work related fatigue on officers' performance, including their “tactical social interaction” (TSI) skills.

Methods: N = 80 experienced police patrol officers (selected from day and night shifts) were tested in a controlled laboratory setting using high-fidelity computerized training simulators with custom-made, research-based TSI scenarios. Novel TSI metrics were developed to measure participant performance in real time, which enabled branching of TSI scenarios based on how effectively participants were interacting with people in the simulator. TSI performance immediately after the last of five consecutive 10:40 hour work shifts (fatigued condition) was compared to TSI performance at the same time of day after 72 hours off (rested condition). Participants were monitored using wrist actigraphy for seven days immediately preceding each experimental day.

Results: Multi-level modeling (MLM) revealed that participants in the “day sleeper” condition (night-shift workers) were significantly less likely to have a successful outcome on the TSI scenarios (wald = 5.11; df = 1; p = 0.024). Although being in the fatigued condition did not significantly predict scenario outcome, fatigued officers were less likely to introduce themselves to civilians than they were when rested (wald = 4.27; df = 1; p = 0.039).

Conclusion: These results lay the foundation for addressing the impact of shift work-related fatigue on how officers interact with members of the public in day-to-day encounters that can either increase or erode trust in police. The negative impact of fatigue on TSI has significant implications in the current climate of police-citizen unrest, where perceptions of police legitimacy are low.

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0195
IST BREAK VS 2ND BREAK AS A PREDICTOR OF FATIGUE, SLEEPINESS, AND PERFORMANCE AT TOP OF DESCENT DURING LONG RANGE AND ULTRA-LONG RANGE FLIGHTS
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Introduction: Top of descent (TOD) is a critical phase of flight because it is when the pilot initiates the descent to landing. We studied the effect of taking a 4-5 hour rest/sleep opportunity in the 1st half compared to the 2nd half of the flight on fatigue, sleepiness, and performance at TOD in long-range (8-16 hours) and ultra-long range (16+ hours) flights.

Methods: The flights studied originated either in 1) San Francisco (SFO), California and flew non-stop to Sydney (SYD) or Taipei (TPE), Taiwan or 2) Los Angeles (LAX), California and flew non-stop to Melbourne (MEL) or Shanghai (PVG), China. The pilots had a layover between 24-48 hours and then returned to SFO or LAX. Each pilot's total inflight sleep (TIFS) was measured by actigraphy. At TOD for both Outbound and Inbound flights, fatigue was measured by the Sann-Perelli Fatigue Scale (SP) and sleepiness was measured by the Karolinska Sleepiness Scale (KSS). Pilot performance at TOD was measured by the 5-minute psychomotor vigilance task (PVT).

Results: We studied 79 pilots (11 women), mean age 52 years +/- 7.01 SEM. We examined whether taking the 1st break or 2nd break predicted fatigue, sleepiness, and performance at TOD. Flight times were between 10-18 hours. We found significantly more fatigue and sleepiness at TOD in pilots taking the first break compared to those taking the second break. We found no significant difference in total inflight sleep or speed on the PVT between pilots taking the first break and those taking the second break. These results were the same for pilots flying Outbound and Inbound.

Conclusion: The results indicate that taking the second break for rest and sleep reduced fatigue and sleepiness at TOD for pilots flying long range and ultra-long range flights.

Support (If Any): The study was supported by United Airlines.

0196
AN EXPLORATORY ANALYSIS OF PILOT SLEEP OPPORTUNITY PREFERENCES ON ULTRA-LONG RANGE FLIGHTS
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Introduction: Ultra-Long Range (ULR) flights are flown with 4 pilots. During cruise, 2 pilots at a time can be in the bunk facility sleeping. The ULR flights studied originated in California (San Francisco or Los Angeles) and flew non-stop to Australia (Melbourne (MEL) or Sydney (SYD)) and, after a layover, returned to California. Flight times were between 13-15 hours. The pilots in command (PIDs) - the two pilots flying the aircraft during take-off and landing - have their choice of when to take their inflight sleep opportunity. We examined whether the PIDs preferred to sleep during the 1st break, 2nd break, or take a split break, and how their choice related to their estimated circadian rhythm.

Methods: Pilots flew Outbound and Inbound for MEL or SYD. Inflight sleep, measured by actigraphy and self-report, was plotted to determine which break the PIDs chose and if there was, relative to home base time, a preference to sleep during the window of circadian low (02:00 - 06:00), the afternoon dip in alertness (15:00 - 17:00), or the window of circadian high (20:00 - 22:00).

Results: We studied 38 pilots (6 women), mean age 56 years +/- 5.97 SEM. For Outbound flights, the PIDs chose first break on 14 of 38 flights, second break on 19 of 38 flights, and split break on 5 of 38