DIFFERENCES IN CLINICAL SLEEP OUTCOMES AND MOOD DURING DAY SHIFT AND NIGHT SHIFT SCHEDULES IN U.S. NAVY WATCHSTANDERS

Emily M. Moslener[1,2] ; Sarah A. Chabal[1,2] ; Rachel R. Markwald[1]

[1]Warfighter Performance Department, Naval Health Research Center, San Diego, CA, USA;
[2]Behavioral Health & Readiness Division, Health & Services Sector, Leidos., Inc., San Diego, CA, USA

BACKGROUND

- Many military commands require 24/7 operations, necessitating that personnel be on shift around the clock. To accommodate this, operators rotate between day and night shifts.
- Night shift work poses unique challenges that can be difficult to adjust to, including negative impacts on sleep quality, performance, mood, and overall health [1].
- The present study investigates the within-subject differences in clinical sleep outcomes and mood in watchstanders during day shift and night shift rotations.

MATERIALS AND METHODS

- U.S. Navy Sailors (N = 146) were recruited from two shore-based commands that stood continuous 24 h watchbill rotations.
- Sailors completed surveys at every schedule rotation (approximately monthly) that included:
  - Insomnia Severity Index (ISI)
  - Epworth Sleepiness Scale (ESS)
  - Abbreviated Profile of Mood States (POMS)
  - Sleep sufficiency questionnaire (e.g., "*During this rotation, how much sleep did you receive?"* response range 0 = Much less than needed, 4 = Much more than needed)
- Linear mixed models evaluated the effects of shift timing on subjective sleep, clinical sleep outcomes, and mood.

REFERENCES

1. Kecklund, G., & Axelsson, J. (2016). Health consequences of shift work and insufficient sleep. *BMJ*, *355*.
2. Klingaman, E. A., Brownlow, J. A., Boland, E. M., Mosti, C., & Gehrman, P. R. (2018). Prevalence, predictors and correlates of insomnia in US army soldiers. *Journal of Sleep Research*, *27*(3).
3. Haran, F. J., Schumacher, P., Markwald, R., Handy, J. D., & Tsao, J. W. (2019). Relationships between sleepiness, mood, and neurocognitive performance in military personnel. *Frontiers in Neurology*, *10*, 674.

RESULTS

- No reported differences in sleepiness (ESS) in day shift compared to night shift ($p > .05$).
- No reported differences in subjective sleep sufficiency on day shift compared to night shift ($p > .05$).
- Personnel working the day shift experienced less insomnia than those on the night shift (X^2 (1, 146) = 6.76, p = .009; see Figure 1).
  - Almost half (47%) of Sailors on night shift reported levels of insomnia that may require clinical intervention (ISI > 14)
- Sailors reported less mood disturbance (POMS) when working day shift compared to night shift (X^2 (1, 146) = 7.00, p = .008; see Figure 2).

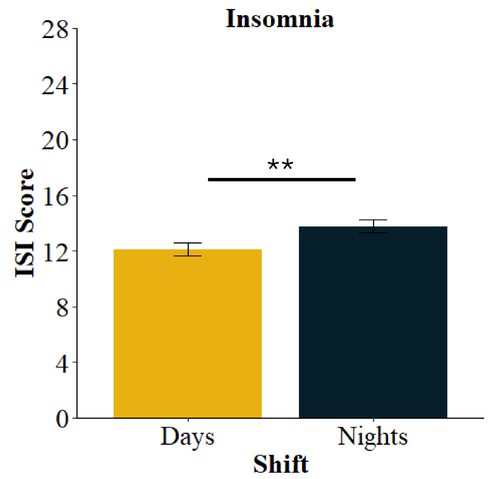

Figure 1. Mean ± SE score on the Insomnia Severity Index (ISI). Higher scores represent worse insomnia symptoms.

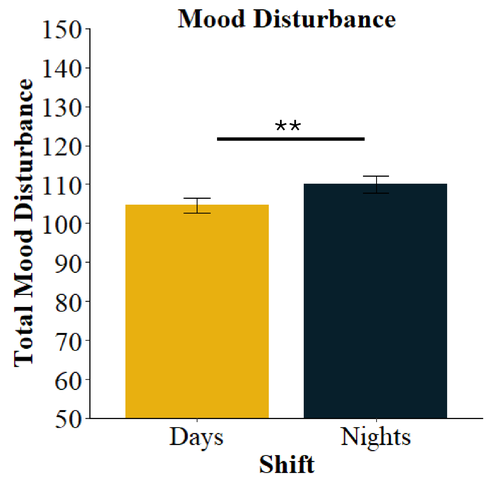

Figure 2. Mean ± SE Total Mood Disturbance on the Profile of Mood States (POMS). Higher values represent worse mood.

CONCLUSIONS

- Working on a night shift rotation yields higher rates of insomnia symptoms and mood disturbances compared to day shift, despite no significant impact on the sufficiency of sleep reportedly received. This suggests that perceptions of sleep may not reflect clinical sleep outcomes.
- Insomnia and mood disturbances have negative effects on military team performance, morale, and readiness [2,3].
  - Watchbill management and fatigue management strategies should focus on improving daytime sleep (i.e., the sleep received while working night shift) to reduce insomnia incidence.
  - Future research should evaluate whether interventions, such as prescribed sleep-aides or lighting manipulations to help the body adapt to a night shift schedule, support Sailors during shift work schedules.

 This work was supported by **Naval Medical Forces Pacific and Naval Advanced Medical Development** under work unit no. **62513**. The views expressed in this work are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, nor the U.S. Government. The study protocol was approved by the **Naval Health Research Center** Institutional Review Board in compliance with all applicable federal regulations governing the protection of human subjects. Research data were derived from approved **Naval Health Research Center** Institutional Review Board protocol number **NHRC.2025.0007**.