



STIMULANT USE, SCREEN TIME, SLEEP, AND FATIGUE IN DEPLOYED U.S. SAILORS

Josue E. Uriarte^{1,2}, Peter G. Roma^{1,2}, Genieleah A. Padilla^{1,2}, Emily Moslener^{1,2}, R. Wayne Quinn³, Rachel R. Markwald¹, Alice D. LaGoy¹

¹Warfighter Performance Department, Naval Health Research Center, San Diego, CA; ²Leidos, Inc., San Diego, CA; ³Commander, Naval Surface Force, U.S. Atlantic Fleet, Norfolk, VA



Introduction

- Sailors in the U.S. Navy use different behavioral strategies to cope with the stressors of deployed settings (e.g., stimulant use, screen use before bed).
- Although these strategies are acutely effective, they do not promote long-term health or readiness.
- Understanding these behaviors and their changes during deployment may inform the development of education for healthier adaptive strategies.

PURPOSE: To examine relationships between self-reported wake-time behaviors, sleep disturbances, and fatigue in deployed sailors.

Methods

Sailors ($N = 1,120$, 27 ± 7 years [mean $\pm$ SD]) from five warships deploying with a Carrier Strike Group completed surveys at pre-deployment and mid-deployment assessing:

- Self-reported wake-time behaviors included caffeine intake, nicotine use, and screen use.
 - Screen Use – Work: time for completing work-related tasks
 - Screen Use – Personal: time for completing personal use
 - Screen Use – Bed: overall screen use an hour before bed
- Patient-Reported Outcomes Measurement Information System (PROMIS) Sleep Disturbance Short Form 8b.
 - Higher PROMIS scores reflect greater levels of sleep disturbances.
- Emotional, mental, and physical fatigue
 - A 5-point Likert scale; scores between the three subcategories were averaged.

Caffeine and nicotine users were binned into users/non-users, and changes in intake across deployment were binned into increased, decreased, and consistent use.

Statistical Analysis

Relationships between wake-time behaviors, sleep disturbances, and fatigue were examined using linear mixed models, controlling for age and with individual as a random intercept.

Results

- Pre-deployment sleep disturbance (55.0 ± 7.0) and fatigue (3.2 ± 0.9) levels did not differ from mid-deployment levels (56.0 ± 7.0 ; 3.2 ± 0.9).
- Screen time for work was related to slightly higher sleep disturbances, $F(1,972) = 4.3$, $p < .05$.
- Screen time for work was related to slightly higher fatigue, $F(1,1091) = 10.6$, $p < .01$.
 - With a significant screen time $\times$ caffeine intake interaction, $F(1,678) = 4.3$, $p < .01$.
- There were no relationships between other screen behaviors or nicotine use with sleep disturbances or fatigue ($ps > .05$).

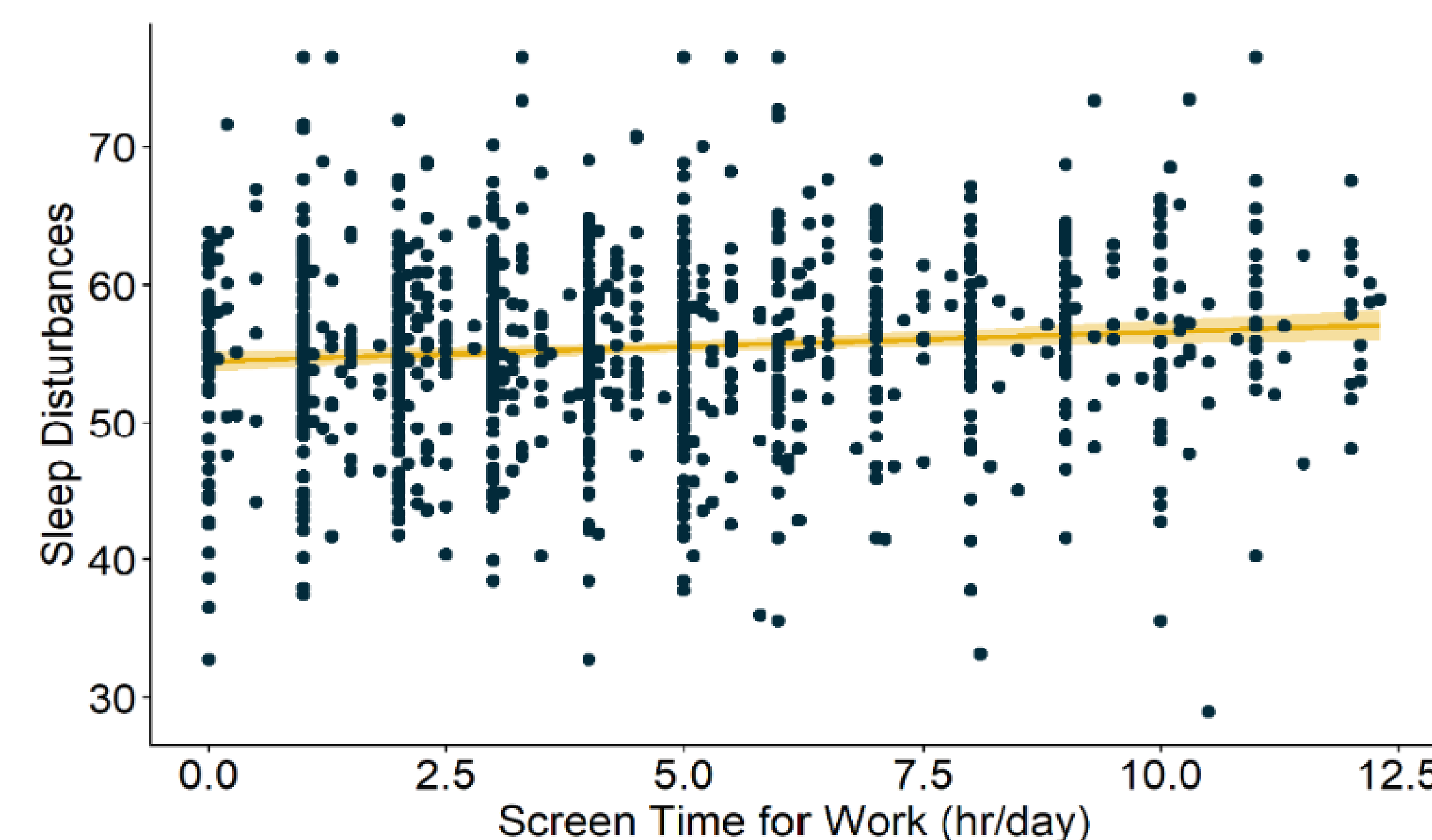


Figure 1. Relationship between screen time for work and sleep disturbances. Higher screen time was associated with higher sleep disturbances.

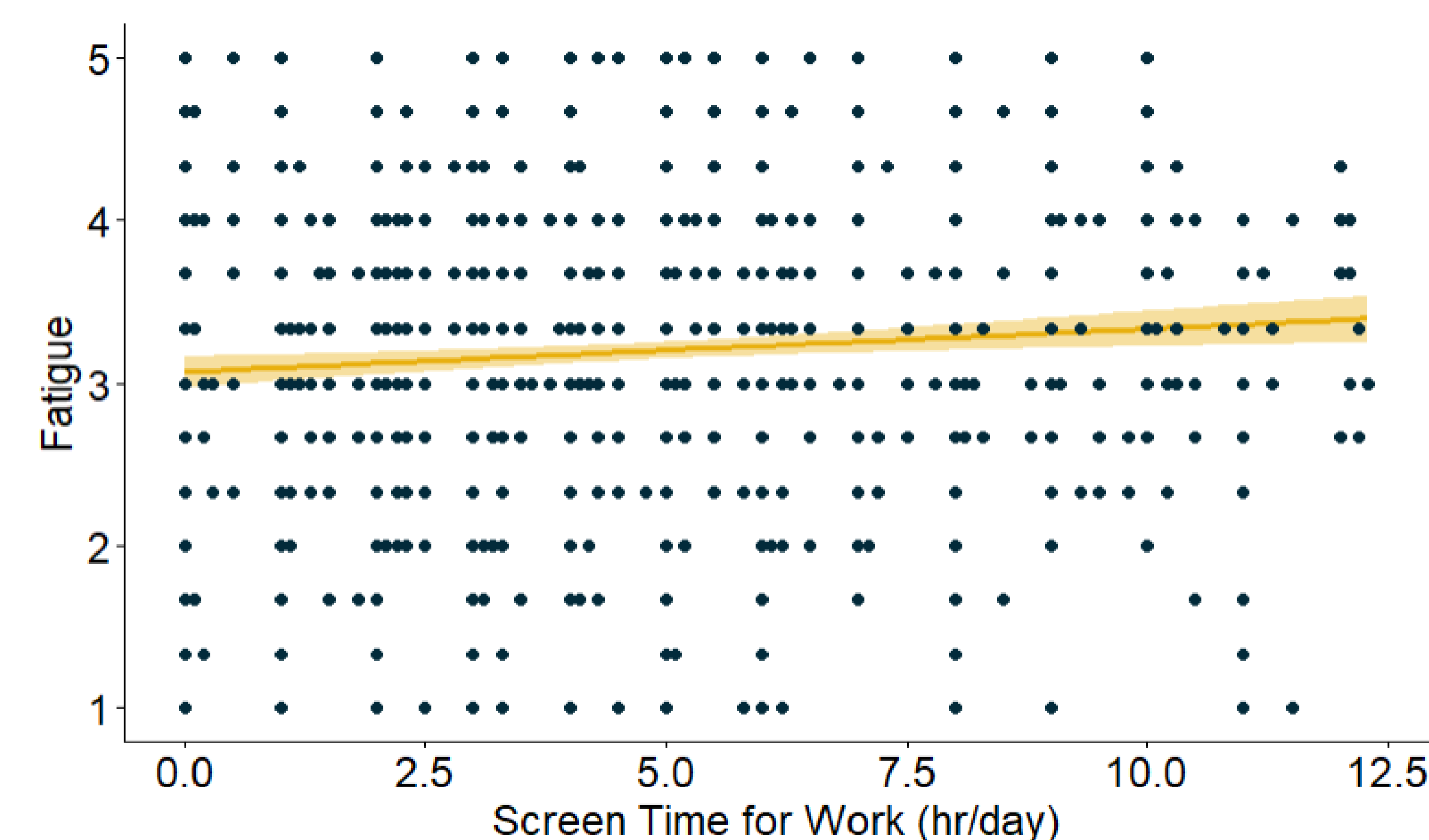


Figure 2. Relationship between screen time for work and fatigue. Higher screen time was associated with higher fatigue.

Results (cont.)



Figure 3. Interaction effect of screen time for work and caffeine use on fatigue.

Conclusion

- Daily work-related screen use was related to higher sleep disturbances and fatigue, while caffeine use affected the relationship between screen use and fatigue for non-users.
- It may not be feasible to reduce work-related screen use, but strategies to reduce its impact on sleep disturbances and fatigue should be further explored.
- Personal screen use was not associated with these effects. However, we did not examine effects of specific types of screen use (e.g., gaming, social media), which merits further exploration.
- A deeper understanding of the relationship between wake-related behaviors, fatigue, and sleep can inform the development of educational and procedural strategies to improve and support crew operational readiness and health.

Partners/Collaborators

