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Culture Change in the US Navy: From Data Collection to Mandated Policies

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INTRODUCTION

Since 2001, the Naval Postgraduate School Crew Endurance Team has conducted numerous studies on more than 30 surface combatant ships of the United States Navy (USN) documenting the sleep patterns and performance of Sailors.

AIM

To determine which watchstanding and work schedules are most effective while crews are underway, and to provide actionable recommendations to the US Navy leadership.

METHODS

- All studies were naturalistic and longitudinal.
- Sailor (N=1269; 25 yrs of age, range 18 to 54 yrs; ~78% males; ~82% enlisted personnel)
- We assessed daytime sleepiness, sleep quality, insomnia symptoms, mood, psychomotor vigilance performance, and work hours. Sleep was assessed with actigraphy and logs.

RESULTS

- Compared to non-circadian watchbills (i.e., rotating watchstanding schedules leading to a non-24-hour work/rest pattern), circadian-based watchbills (i.e., fixed watchstanding schedules with work/rest patterns resulting in a 24-hour day) and watchbills with more sections were associated with higher alertness, less severe insomnia symptoms, better sleep quality, and better mood.
- Crewmembers on circadian-based schedules responded faster and made fewer errors than their counterparts on non-circadian-based schedules.
- Differences between circadian and non-circadian watchbills were more pronounced in 3-section compared to 4-section watchbills.

CONCLUSIONS

- These results validate the operational utility of circadian-based watchbills.
- Non-circadian-based watchbills should be avoided if at all possible.
- The efficacy of circadian-based watchbills seems to be even greater when manning is limited, i.e., when ship's company cannot support the use of 4-section watchbills.
- Our recommendations informed the fleet-wide directive to implement circadian-based watchbills onboard all US Navy surface ships. In parallel, the development of crew endurance and sleep hygiene training programs was initiated to improve shipboard operational performance.

Figure 1. *ESS, ISI, PSQI, and POMS TMD scores*

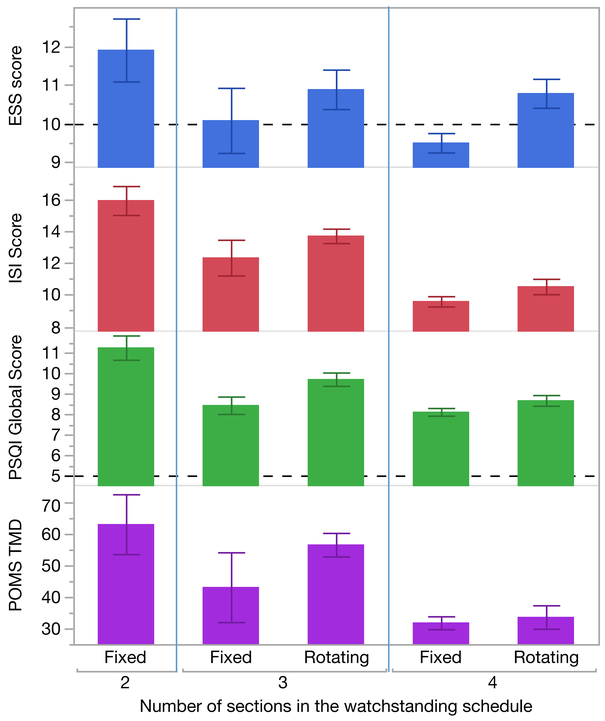


Figure 2. *POMS subscales' scores*

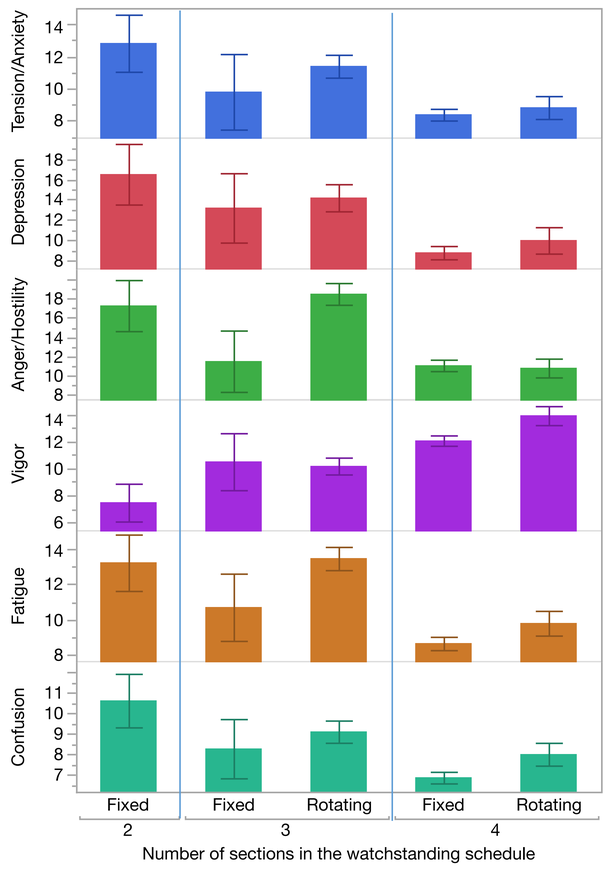


Figure 3. *Sleep from actigraphy and FOM scores*

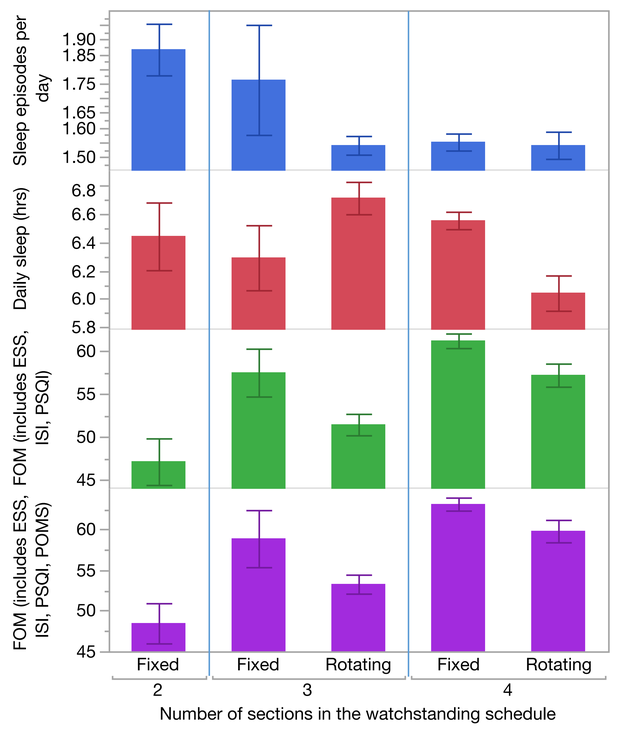
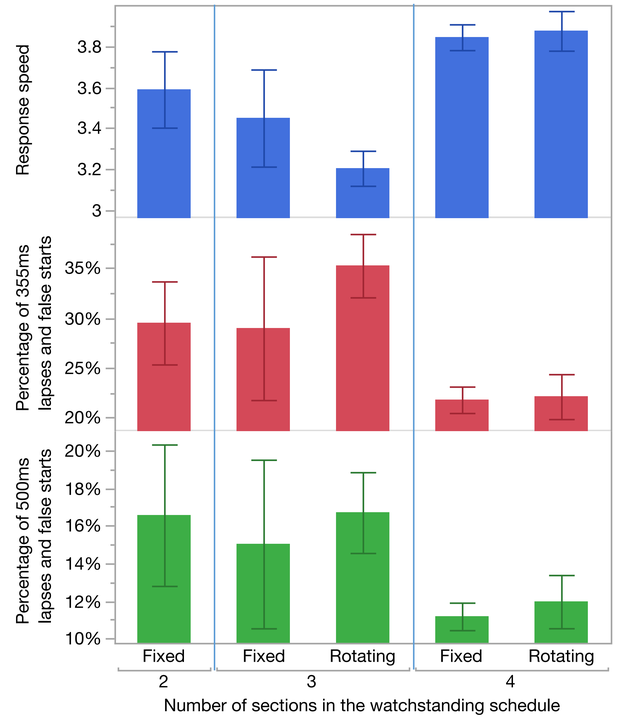


Figure 4. *Psychomotor vigilance performance*



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