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# 0821 Gender Differences in Sailor Well-Being, Sleep-Related Behaviors, and Psychomotor Vigilance Performance in the United States Navy

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Wake-up time was not associated with age for ages 6-21 ( $r = 0.20$ ) but was earlier with increasing age for ages 22 and up ( $r = -0.71$ ). The strength of these associations was modified by continent and study design, but not by type of actigraphy device or number of nights of data collection.

**Conclusion:** Weak associations between age and actigraphy-assessed duration and efficiency suggest that inadequate sleep quantity or poor sleep continuity should not be dismissed as typical consequences of aging. Large associations between age and sleep timing, despite a small literature, highlights a promising area for further study, particularly to determine the age at which sleep timing shifts from delaying to advancing.

**Support:** MAB was supported by T32 HL07560.

## 0821

### GENDER DIFFERENCES IN SAILOR WELL-BEING, SLEEP-RELATED BEHAVIORS, AND PSYCHOMOTOR VIGILANCE PERFORMANCE IN THE UNITED STATES NAVY

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**Introduction:** Approximately 18% of US Navy sailors are females. Research has shown gender-related differences in the prevalence of sleep disorders in active duty personnel (Foster et al., 2017). Specifically, insomnia, depression, and anxiety are more prevalent in females, while obstructive sleep apnea is more prevalent in males. We have studied the sleep patterns and fatigue levels of crew members on more than 30 US Navy ships. The current study focuses on gender differences in well-being, sleep-related behaviors, and psychomotor vigilance performance of sailors in the US Navy.

**Methods:** Using a longitudinal, naturalistic observation paradigm, data were collected from crewmembers on nine USN ships while performing their normal underway duties. Participants ( $N=1,056$ ) tended to be young (on average 27 years of age), predominantly male (80.6%), and enlisted (84.8%). We assessed average daytime alertness (Epworth Sleepiness Scale), insomnia symptoms (Insomnia Severity Index), mood (Profile of Mood States), and sleep quality (Pittsburgh Sleep Quality Index). Sleep was assessed with actigraphy and logbooks. Sailors performed a 3-minute version of the Psychomotor Vigilance Task (PVT), which was built into their wrist-worn actigraph.

**Results:** Compared to males, female sailors reported more depressive symptoms ( $p=0.042$ ) and less vigor ( $p<0.001$ ). Females slept more (daily sleep duration:  $p<0.001$ ) but their sleep was split into more episodes than their male counterparts ( $p=0.029$ ). Fewer females reported a regular exercise routine ( $p=0.033$ ). In addition, females report consuming fewer energy drinks ( $p=0.007$ ), and using fewer nicotine products ( $p=0.013$ ). Lastly, consistent with findings from civilian populations, female sailors had slower reaction times on the PVT ( $p<0.001$ ) and experienced more lapses combined with false starts ( $p<0.001$ ) than their male counterparts.

**Conclusion:** Compared to their male peers, female sailors tend to report higher levels of depression and lower levels of vigor. They experience more pronounced split sleep, are less likely to report having an exercise routine, and have poorer performance on the PVT. Fewer females report using energy drinks and nicotine products.

**Support:** This research was supported by the Naval Medical Research Center's Advanced Medical Development Program, the US Navy 21st Century Sailor Office, and the US Navy OPNAV N1.

## 0822

### FRAIL OLDER MEN WITH NOCTURIA ARE DISPROPORTIONATELY AFFECTED BY EXCESS NOCTURNAL URINE PRODUCTION

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**Introduction:** Nocturia is a risk factor for falls and hip fractures in older adults. We determined whether the Frailty Index (FI), incorporating comorbidities, functional performance, and physical signs, was associated with nocturia frequency and/or overnight urine production.

**Methods:** We examined nightly (24-hour) voiding diaries (men  $\geq 65$  years) in an outpatient urologic clinic demonstrating  $\geq 2$  nocturnal voids ( $n=158$ ). FI calculations followed Rockwood (CMAJ 2005;173:489-95). A total of 39 conditions were assessed. Three FI groups were established: Low ( $\leq 0.077$ ) ( $n=59$ ), Intermediate ( $>0.077$  and  $<0.179$ ) ( $n=58$ ), and High ( $\geq 0.179$ ) ( $n=41$ ). We compared number of nocturnal voids (NV), nocturnal urine volume (NUV) (in mL), and 24-hr total urine volume (24-hr TUV) (in mL) across groups.

**Results:** NV did not differ by group ( $p=0.333$ ) (median for all groups=3). However, NUV (916 [671-1419] vs. 690 [505-942] vs. 630 [500-1050] mL) differentiated the High, Medium and Low FI groups ( $p<0.001$  via Kruskal-Wallis with Bonferroni pairwise adjustments), respectively. Similarly, 24-hr TUV differentiated the 3 groups (2200 [1800-2550] vs. 1620 [1259-2119] vs. 1650 [1390-2517] mL,  $p=0.005$ ). Differences in NUV remained significant ( $p=0.006$ ) after eliminating Diabetes Mellitus cases ( $n=44$ ). However, differences did not persist for 24-hr TUV ( $p=0.180$ ).

**Conclusion:** Higher NUV, but not 24-hr TUV, was a robust correlate of frailty in these older men. Accounting for diabetes did not diminish the effect. Although undiagnosed sleep apnea remains a possible cause, recent chronobiologic data (Monaghan et al, Age Aging, 2020, in press) suggest that nocturia in the aged is characterized by excess free water clearance early in the sleep period. This argues against solute-driven urine production (as might be expected in sleep apnea) in accounting for the effect. Nocturia may represent a conspicuous and important change in circadian rhythm of urine production occurring in old age.

**Support:** N/A

## 0823

### AGE-RELATED CHANGES IN NOCTURNAL URINE COMPOSITION

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**Introduction:** In humans sleeping nocturnally, nocturnal polyuria (NP) refers to high rate of overnight urine production. NP is a heterogeneous condition that may reflect both free water and/