OCCUPATION AND SLEEP TRENDS IN THE U.S. NAVY OR MARINE CORPS: RESULTS FROM THE ANNUAL PERIODIC HEALTH ASSESSMENT, 2017–2021

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NMR&D NAVY MEDICINE RESEARCH & DEVELOPMENT

BACKGROUND

- Military personnel are less likely than civilians to get the recommended 7–9 hours of sleep per night
- Military occupation is strongly associated with sleep quality, but questions remain about occupation and sleep patterns
- Longitudinal data from the annual Periodic Health Assessment (PHA) can be used to examine occupation-specific sleep trends
- The PHA's large sample and repeated measures can help identify occupations at risk of sleep deterioration over time

OBJECTIVES

1. To examine distributions of demographic and sleep-related characteristics by occupational category
2. To estimate associations of occupational category with self-reported "sufficient sleep"
3. To estimate "sufficient sleep" prevalences and display occupation-specific sleep trajectories

METHODS

Data Source

- Annual PHA from 2017 to 2021

Study Population

- Active duty U.S. Navy and Marine Corps

Outcome

- Self-reported "sufficient sleep" (Yes/No) defined as ≥7 hours sleep per night during the past 2 weeks

Exposure

- Occupational categories derived from Defense Manpower Data Center codes

Statistical Analysis

- Generalized estimating equations (GEE) with a log link were used to account for repeated measures per individual to obtain:
  - Crude and adjusted odd ratios (OR) of sufficient sleep by occupation (relative to combat personnel) during the 5-year study period
  - Model-estimated prevalence of sufficient sleep by occupation at:
    1. Initial: first PHA during the study period
    2. Follow-up: estimated at 365 days using all PHAs after the initial PHA
- All GEE models were adjusted for age, sex, and service

Table 1. Population Characteristics by Occupation[a]

Characteristic	Combat N=90K	Technical N=203K	Medical N=29K	Admin N=92K	Officers N=64K
Service branch					
Marine Corps, %	69%	33%	0%	54%	34%
Navy, %	31%	67%	100%	46%	66%
Age, yrs, mean ± SD	23 ± 5	27 ± 7	27 ± 7	27 ± 7	34 ± 8
Female sex, %	10%	15%	30%	23%	12%
Deployed in past 5 years, yes, %	36%	48%	29%	36%	49%
Duty-limiting health condition, yes, %	32%	41%	41%	43%	40%
Self-rated health, "Excellent," %	31%	21%	24%	21%	35%
Ambien (Zolpidem) in open text, yes, %	0.1%	0.3%	1.0%	0.4%	0.6%
Sufficient sleep, ≥7 hrs per night, %	35%	29%	26%	28%	41%

Table 2. Association Between Occupation and Sufficient Sleep

Occupational Categories	≥7 hrs sleep per night[a] Yes (N=157,039)	No (N=339,028)	Crude OR	Age-adjusted model[b] OR	95% CI	Multivariable model[b] OR[a]	95% CI
Combat	31,279	58,951	Ref	Ref		Ref	
Technical	59,425	143,631	0.8	0.9	0.9, 0.9	0.8	0.8, 0.8
Medical	7,651	21,580	0.7	0.7	0.7, 0.8	0.6	0.6, 0.7
Admin	25,437	67,030	0.7	0.8	0.8, 0.8	0.7	0.7, 0.7
Officer	26,697	38,053	1.3	2.1	2.0, 2.1	1.4	1.4, 1.4
Healthcare officer	4,036	6,690	1.1	2.0	1.9, 2.1	1.2	1.2, 1.2

[a]Reported on the initial PHA
[b]GEE model regressing "sufficient sleep" on occupation with covariates: age, sex, and service

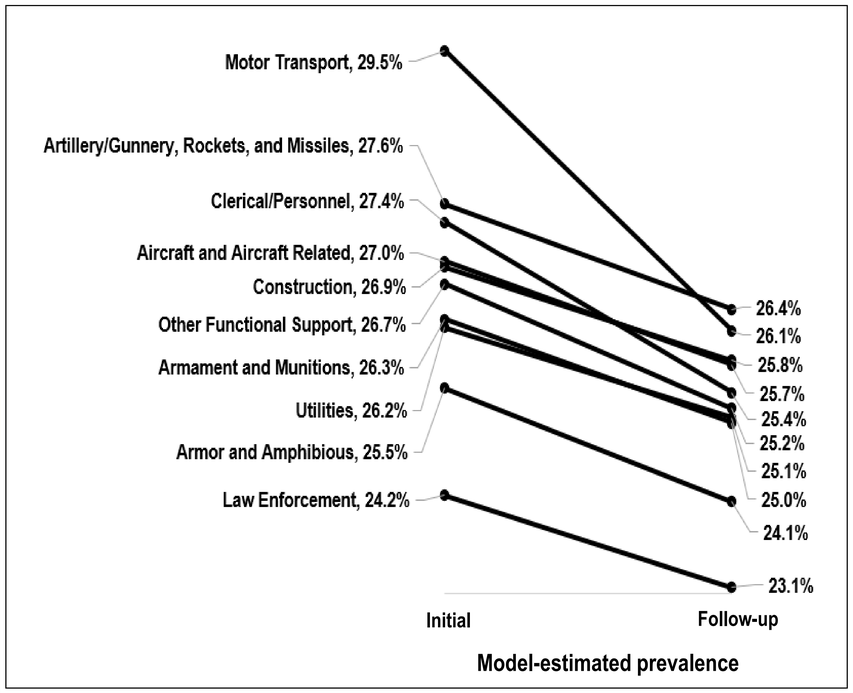
RESULTS

- Total sample (N=496,079) was 59% Navy and 41% Marine Corps
- Mean count of PHAs completed per individual was 2.02 ± 1.01
- Across 48 Navy occupations, the model-estimated prevalence of sufficient sleep at initial PHA ranged from 21.2% to 52.0%
- Navy overall model-estimated prevalence of sufficient sleep decreased by relative 2.9 -%/yr (95% CI: 2.6, 3.2 -%/yr)
- Across 55 Marine Corps occupations, the model-estimated prevalence at initial PHA ranged from 22.7% to 49.2%
- Marine Corps overall model-estimated prevalence of sufficient sleep decreased by relative 4.1 -%/yr (95% CI: 3.5, 4.6 -%/yr)

CONCLUSIONS

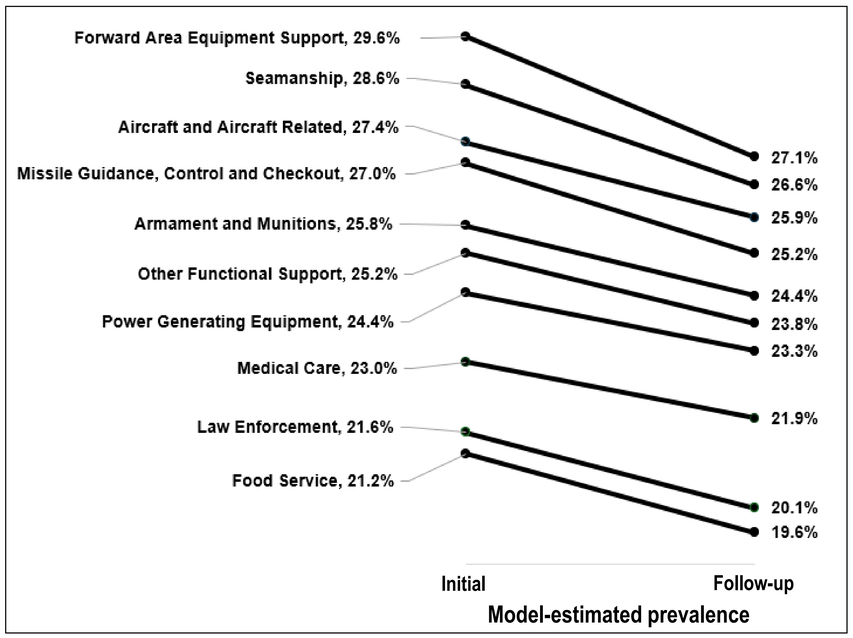
- This study demonstrates a method to identify occupations at greater risk of sleep deterioration over time
- Results could inform targeted interventions to improve sleep quality for at-risk occupations and improve operational readiness
- Future studies are needed to understand how occupations contribute to sleep quality over time

Top 10 Marine Corps Occupations by Declining Sleep



*Due to space limits, figures display only occupations with:
- Sample >0.5% of respective Navy or Marine Corps total population
- Sufficient sleep-model-estimated prevalence <30% at initial PHA
- Top 10 greatest decline over time

Top 10 Navy Occupations by Declining Sleep



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