INSOMNIA

Prevalence, Correlates, and Predictors of Insomnia in the US Army prior to Deployment

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Study Objectives: To determine the prevalence, correlates, and predictors of insomnia in US Army personnel prior to deployment.

Methods: Cross-sectional cohort design assessing insomnia and other psychosocial variables in active duty service members (n = 4,101), at Fort Hood, Texas, prior to military deployment. Insomnia was defined as an Insomnia Severity Index ≥ 15.

Results: The prevalence of insomnia was 19.9%. Enlisted personnel were five times more likely to report insomnia than officers (odds ratio [OR] = 5.17). Insomnia was higher among American Indian/Alaskan Natives than other groups (ORs = 1.86–2.85). Those in the Insomnia Group were older, had longer military careers, and reported more marriages, children, and military deployments (*d*s = 0.13–0.34) than the No Insomnia group. The Insomnia Group reported more severe mental health symptoms, more recent stressful life events, greater childhood abuse, and lower levels of trait resilience, social support, and unit cohesion (Cohen *d*s = 0.27–1.29). After controlling for covariates, the Insomnia Group was more likely to have a history of head injuries and clinically significant posttraumatic stress disorder (PTSD), anxiety, depression, alcohol use problems, back pain, extremity pain, headaches, and fatigue (ORs = 1.40–3.30). A simultaneous logistic regression found that greater PTSD, depression, fatigue, stressful life events, headaches, anxiety, alcohol use problems, extremity pain, history of head injury, childhood physical neglect, back pain, number of times married, and lower leader support/unit cohesion and tangible social support were statistically significant predictors of insomnia status.

Conclusions: Insomnia occurs in about one of five service members prior to a military deployment and is associated with a wide array of psychosocial stressors and mental and physical health problems.

Keywords: anxiety, Army, depression, insomnia, military, PTSD

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Significance

This was the largest study to date using validated measures of insomnia and psychosocial correlates in a typically healthy active-duty Army sample prior to deployment. Results indicate that, as in civilian populations, insomnia is a significant public health problem among active duty military that is associated with a range of mental and physical health problems. This study highlights the importance of addressing insomnia in this population. Longitudinal studies are needed to understand the course of insomnia and other sleep disorders (e.g., apnea, shift work, sleep deprivation) in the military and to determine temporal relationships with comorbidities. Studies are also needed to determine best practice guidelines for treating insomnia within the demanding work schedule of the military.

INTRODUCTION

Military service members face a number of stressors and challenges that place them at increased risk for insomnia compared to most civilians. These include, but are not limited to, frequent overnight and early-morning shift work, exposure to deployment stressors, frequent changes in duty assignments, and changes in duty station. To date, the prevalence and correlates of insomnia have not been evaluated comprehensively in a large cohort of service members. Table 1 includes a summary of select previous studies examining insomnia in active duty samples. As summarized in Table 1, existing evidence suggests that insomnia in the military ranges from 8% to 63%.[1–7] This wide range in estimates is likely a result of the different operational definitions of insomnia used, as well as the varied, primarily medical samples assessed. Studies of insomnia in the military have not thoroughly examined the demographic characteristics, the types of stressors service members face, the resources that may mitigate stress, or the mental health and physical health predictors of insomnia.

The most frequent method of assessing insomnia in the military has been a single sleep-relevant item from measures of depression or posttraumatic stress disorder (PTSD). These items are inadequate because they assess one or two symptoms of insomnia. For instance, two military studies[1,6] utilized the sleep item from the PTSD Checklist-Military Version (PCL-M),[8] which asks how "bothered" (from "not at all" to "extremely") respondents have been in the past month by "Trouble falling or staying asleep." Considering that "Trouble falling or staying asleep" is only one diagnostic criterion of insomnia, this single item may be too sensitive, artificially inflating prevalence estimates by including individuals with subclinical insomnia. Two other studies[3,6] utilized the sleep item from the Patient Health Questionnaire-9 (PHQ-9),[9] which asks about the frequency of "Trouble falling or staying asleep, or sleeping too much," which is problematic on two levels. First, similar to the PCL-M, the "Trouble falling or staying asleep…" component is too sensitive. Second, "sleeping too much" is a symptom of an entirely different class of sleep disorders (e.g., sleep apnea), which artificially inflates insomnia prevalence estimates by including individuals with sleep disorders other than insomnia.

Previous studies of military personnel that utilized valid assessment methods (e.g., validated insomnia questionnaires,

Table 1—Select previous studies examining insomnia in active duty samples, ordered by definition and date of publication.

Study	Sample Source	N	Male	Age (M)	Definition of Insomnia/ Sleep Disturbance	Prevalence of Insomnia/ Sleep Disturbance
Hoge et al., 2008	3–4 mo postdeployment	2,525	96%	< 30	PHQ-9 sleep item ≥ 2	24% - No head injury 45% - Head injury-altered status 54% - Head injury-loss of consciousness
McLay et al., 2010	Postdeployment screening	2,224	76%	29	PCL sleep item ≥ 2	Total Sample: 33% - 0 mo postdeployment 37% - 3 mo postdeployment Iraq and Afghanistan Sample: 41% - 0 mo postdeployment 36% - 3 mo postdeployment
Seelig et al., 2010	Millennium cohort	41,225	79%	34	PHQ-9 sleep item ≥ 1 *or* PCL sleep item ≥ 3	25% - No deployments 31% - Deployed 27% - Postdeployment
Bryan, 2013	TBI clinic in Iraq	150	100%	27	ISI score	36% - No insomnia 30% - Subthreshold insomnia 27% - Clinical insomnia-moderate 8% - Clinical insomnia-severe
Morrow et al., 2013	US Air Force active duty pararescuemen	140	100%	30	ISI score	14% - Clinical Insomnia
Collen et al., 2012	TBI clinic in US	116	97%	31	DSM-IV diagnosis by board-certified sleep specialist	55% - Overall 63% - Blast injuries 20% - Blunt trauma
Mysliwiec et al., 2013	Sleep disorders clinic	725	93%	36	ICSD-2 diagnoses by board-certified sleep specialist	25% - Overall

DSM-IV, Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition; ICSD-2, International Classification of Sleep Disorders, 2nd edition; ISI, Insomnia Severity Index; PCL, PTSD Checklist; PHQ-9, Patient Health Questionnaire-9 (sleep item = "Trouble falling or staying asleep, or sleeping too much"); TBI, traumatic brain injury.

structured clinical interviews, polysomnography) have limited external validity because they evaluated small samples in clinical contexts (e.g., in sleep disorder clinics), which substantially and artificially inflates prevalence estimates.[10] For instance, although Bryan et al.[5] utilized the empirically validated Insomnia Severity Index (ISI),[11] the population surveyed was a small sample of males evaluated at a traumatic brain injury clinic during a deployment to Iraq (N = 150). Similarly, Morrow et al.[7] used the ISI in a small (N = 140) group of US Air Force pararescuemen. Two studies[2,4] used "gold standard" clinical interviews and polysomnography (i.e., sleep studies) administered and interpreted by a sleep specialist to determine insomnia diagnoses and rule out other sleep disorders. However, one study[4] evaluated a small sample (N = 116) of soldiers returning from combat with mild to moderate traumatic brain injury. The other study[2] evaluated a large sample (N = 725) of service members referred to a specialty sleep disorders clinic.

Previous studies of insomnia in the military have also not sufficiently explored potential predictors (putative causes and consequences) of insomnia. This is an important gap considering that insomnia is one of the most common symptoms of and risk factors for psychological health and medical conditions.[10,12,13] Without this information, research on identification of risk and prevention is impeded. Some of the studies in Table 1 suggest that service members with significant insomnia symptoms are more likely to be female,[2] have more mental health symptoms (e.g., PTSD, depression, anxiety, problem drinking),[2,5,6] and physical health symptoms.[2,6] They are also more likely to have previously deployed and to have had an increased number and severity of head injuries.[2,3,5] However, insomnia has also been associated with a number of other psychosocial, mental health, and physical health problems in civilians, including irritability, fatigue, accidents, absenteeism, suicidality, reduced quality of life, concentration problems, and decreased immune functioning.[10,12–16]

The primary aim of this study was to determine the prevalence of insomnia in a large sample of active-duty military personnel using a valdiated measure of insomnia. We predicted that rates of insomnia among service members would be higher than rates found in civilian samples[17] but lower than rates found in previous studies of military cohorts because of the use of the validated measure of insomnia. The secondary aim was to replicate previous findings from military samples that have shown an association of insomnia symptoms and various demographic,[2] mental health,[2,5,6] and physical health[2,3,5,6] correlates. The third aim was to explore the association between insomnia and additional variables associated with insomnia in civilian samples including anger,[18] stressful life events,[19] childhood abuse,[20,21] trait resilience,[20] social support,[22] and marital status.[23] Finally, an exploratory aim was to examine the association between insomnia and unit cohesion and the number of children in this cohort, because these are unique potential

sources of strain or potential resources for managing stress in the military.[24–26]

METHODS

Participants

This study analyzed the predeployment baseline data from a prospective, longitudinal, epidemiological study of the genetic and environmental predictors of combat-related PTSD in active-duty military personnel. We analyzed data from 4,101 of the 4,120 active duty service members at Fort Hood in Killeen, TX enrolled at baseline in the parent study. Participants were included if they were: (1) English-speaking; (2) active duty, activated Reserve, or activated National Guard Service Members of any branch of the US Armed Services; and (3) were scheduled for deployment in support of Operation Iraqi Freedom or Operation Enduring Freedom.

The mean age of the sample was 27.2 (± 6.1) y, and 91.2% were male. The ethnicity of the sample was 80.2% not Hispanic or Latino, 18.6% Hispanic or Latino, and 1.2% not reported. The racial breakdown was 64.1% Caucasian, 15.2% African American, 2.3% American Indian/Alaskan Native, 2.1% Asian, 1.7% Native Hawaiian or Other Pacific Islander, 12.3% other, and 2.3% not reported. Service members were from the US Army and were largely enlisted (93.9%) with at least a high school education (99.3%). Marital status breakdown was 56.0% married, 10.7% separated or divorced, 2.8% in a relationship and living with partner, 11.4% in a relationship but not living with a partner, and 19.0% never married and single.

Procedure

With the support of military commanders, active-duty service members were recruited at unit-level briefings during predeployment processing. After providing written informed consent, participants were given a packet of self-report measures to complete. There were 10 to 15 research staff on hand at each data collection event to answer any participant questions. All scales were administered during one session. The survey battery took an average of 45 min to complete, but service members were given as much time as needed. Research staff reviewed self-report packets to verify completion. The data were collected from units deploying between November 2010 and June 2011. All procedures were approved by the Institutional Review Boards at the University of Texas Health Science Center at San Antonio and Brooke Army Medical Center as well as the US Army Medical Research and Materiel Command Human Research Protection Office. Anonymity of the participants was maintained throughout the study.

Materials

The measures used in the study are common assessment measures with well-established reliability and validity. The reading level was appropriate to active-duty service members, most (99.3%) with high-school education and most with advanced specialized training. The internal consistency reliability measures (i.e., Cronbach alpha) are reported for each measure. In an effort to make the results clinically meaningful and comparable to previous epidemiological studies,[10,12,13,27] we created *post hoc* clinical groups on various variables, as described in the next section.

Demographics and Military Service Characteristics Form

Demographics and military service characteristics were collected with a form developed by the investigators to measure standard demographics (age, sex, race, ethnicity, marital status, number of children) and military service information (e.g., military grade, service length, number of deployments).

Insomnia Severity Index

The ISI is a seven-item measure of the perceived severity of insomnia (i.e., difficulties falling asleep, staying asleep, and waking up too early, and daytime distress related to sleep), with total scores ranging from 0 to 28, where higher scores indicate greater insomnia severity. The Cronbach alpha for the ISI was 0.92 in the current study. Scores are typically classified as No Insomnia (0–7), Subthreshold Insomnia (8–14), Clinical Insomnia-Moderate (15–21), and Clinical Insomnia-Severe (22–28).[11] Participants were further categorized into a No Insomnia Group (i.e., ISI ≤ 14 [No and Subthreshold Insomnia]) and an Insomnia Group (i.e., ISI ≥ 15 [Clinical Insomnia-Moderate and Severe), based on a diagnostic utility study.[17]

Beck Anxiety Inventory

The Beck Anxiety Inventory (BAI) is a 21-item measure of symptoms of anxiety, with total scores ranging from 0–63, where higher scores indicate greater anxiety symptoms.[28] The Cronbach alpha for the BAI was 0.94 in the current study. A cutoff score ≥ 16 (i.e., Moderate to Severe Anxiety symptoms) was used to define clinically significant anxiety.

Beck Depression Inventory-II

The Beck Depression Inventory-II (BDI-II)[29] is a 21-item measure of symptoms of depression with total scores ranging from 0–63, where higher scores indicate greater depression symptoms. The Cronbach alpha for the BDI-II was 0.94 in the current study. A cutoff score ≥ 20 (i.e., Moderate to Severe Depression symptoms) was used to determine clinically significant depression.

PTSD Checklist-Military Version

The PCL-M is a 17-item measure of symptoms of PTSD indexed to military experiences, with total scores ranging from 17 to 85, where higher scores indicate greater PTSD symptoms.[8] The Cronbach alpha for the PCL-M was 0.95 in the current study. We defined PTSD caseness conservatively. Service members had probable PTSD if their total severity score was ≥ 50 and they met the diagnostic criteria for PTSD as outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV). The meeting diagnostic criteria was defined as endorsing the requisite reexperiencing, avoidance and numbing, and hyperarousal symptoms at least to a moderate degree.

Alcohol Use Disorders Identification Test

The Alcohol Use Disorders Identification Test (AUDIT) is a 10-item measure of alcohol consumption that has become

harmful to health, with total scores ranging from 0–40, where higher scores indicate a greater likelihood of an alcohol use disorder.[30] The Cronbach alpha for the AUDIT was 0.95 in the current study. A cutoff score of ≥ 8 was used to define an alcohol use disorder.

State Trait Anger Expression Inventory State Anger Scale

The State Trait Anger Expression Inventory (STAXI) state anger scale is a 10-item measure of the intensity of anger felt at a particular moment in time, with total scores ranging from 10–40, where higher scores represent greater levels of anger.[31] The Cronbach alpha for the STAXI was 0.94 in the current study.

The Patient Health Questionnaire-15

The PHQ-15 is a 15-item measure of medical symptom severity, with total scores ranging from 0–30.[32] The Cronbach alpha for the PHQ-15 was 0.85 in the current study. The current study focused on individual items (i.e., symptoms) rather than PCL-15 total score. Responses of "bothered a lot" (item score = 2) were considered indicative of clinically significant difficulties.

History of Head Injuries

An augmented version of the Defense and Veterans Brain Injury Center (DVBIC) 3-Item Screening Tool[33] was administered to all participants to assess for history of head injuries. As recommended by the DVBIC, participants were considered to have a history of head injuries when they endorsed an injury (Question 1) and altered consciousness (Question 2, Items A-E: "dazed," "confused," or "seeing stars"; "not remembering the injury"; "losing consciousness (knocked out) for [< 1 min, 1–20 min, > 20 min]") for the worst head injury sustained.

Psychiatric Epidemiology Research Interview Life Events Scale – Brief

The Psychiatric Epidemiology Research Interview Life Events Scale[34] is a 102-item measure, designed to assess the number and severity of low- and moderate-magnitude stressful life events that a person has experienced in the previous 6 mo. In order to minimize time burden, the 10 items most relevant to the military population were selected by military subject matter experts. In some cases, the military experts combined items to adequately cover all of the major content areas of the original measure with the fewest number of items. No internal consistency measure was calculated because this is a measure of events and not a measure of a unitary construct.

Childhood Trauma Questionnaire

The Childhood Trauma Questionnaire[35,36] is a 28-item measure that assesses five types (five items each) of potentially traumatizing childhood experiences (i.e., sexual abuse, physical abuse, emotional abuse, emotional neglect, and physical neglect) and minimization/denial (three items indicating the potential underreporting of maltreatment). Trauma subscale total scores range from 5 to 25, where higher scores represent greater exposure to potentially traumatizing events, and the minimization/denial scale total scores range from 0 to 3, with scores > 1 indicating possible underreporting of maltreatment. The Cronbach alpha for the Childhood Trauma Questionnaire was 0.89 in the current study.

Response to Stressful Experiences Scale

The Response to Stressful Experiences Scale (RSES)[37] is a 22-item measure assessing cognitive, emotional, and behavioral traits that promote resilience in the face of life stressors, with total scores ranging from 0 to 110, where higher scores represent greater trait-levels of resilience. The Cronbach alpha for the RSES was 0.92 in the current study.

Interpersonal Support Evaluation List-Short Form

The Interpersonal Support Evaluation List-Short Form (ISEL-SF) is a 12-item measure of multiple dimensions of perceived social support (i.e., Appraisal, Belonging, and Tangible), with subscale total scores ranging from 1 to 16, where higher scores indicate more perceived social support.[38] The Cronbach alpha for the ISEL-SF was 0.84 in the current study.

Walter Reed Army Institute of Research Horizontal and Vertical Cohesion Scales

The Walter Reed Army Institute of Research Horizontal and Vertical Cohesion Scales[39] is a 12-item measure of perceived unit cooperation, dependence, and support. Horizontal support assesses attitudes about, and support from, peers within the military unit, and vertical support assesses attitudes and support from leaders of the military unit. Subscale total scores ranged from 1 to 30, where higher scores indicate greater cohesion. The Cronbach alpha for the horizontal, vertical, and total scales were 0.93, 0.91, and 0.092, respectively, in the current study.

Statistical Methods

For each individual measure, prorated total scores were computed for a participant if he or she provided responses > 70% but < 100% of the items in the measure, with missing responses being replaced by the individual's mean for the remaining items. Those individuals who provided less than 70% of the data for a given measure were considered invalid, and, consequently, did not receive a total score for that measure. After this procedure, scale-level missing data were minimal (< 3%) and appeared to be missing completely at random. Therefore, given that the sample size was large, missing data were not imputed at the scale level, following the recommendations of Tabachnick and Fidell.[40]

Statistical analyses were performed using the Statistical Package for Social Sciences (SPSS 20.0; IBM, Armonk, NY, USA). First, descriptive statistics for ISI scores were examined. Next, groups (No Insomnia vs. Insomnia) were compared on demographic variables, mental health symptom severity and other psychosocial measures previously described using chi-square tests of independence and analyses of variance. Next, unadjusted and adjusted (i.e., controlling for all other significant variables from unadjusted analyses) logistic regression analyses were performed to examine the relationships between insomnia and clinically significant physical and mental health problems. Finally, to determine which clinically significant correlates were most closely related to insomnia status, a

Table 2—Prevalence of insomnia within demographic groups.

Characteristic	No Insomnia	Insomnia	χ^2	P	OR (95% CI)
Sex			0.13	0.72	0.95 (0.72–1.25)
Male (n = 3,719)	80.1%	19.9%			
Female (n = 361)	80.9%	19.1%			
Ethnicity, Hispanic			0.12	0.73	1.04 (0.85–1.27)
Non-Hispanic White (n = 2,390)	80.7%	19.3%			
Hispanic or Latino (n = 764)	80.1%	19.9%			
Race			14.43	0.01	N/A
White (n = 1,939)	80.6%	19.4%			
Black/African American (n = 471)	78.6%	21.4%			
Other/Multiracial (n = 364)	81.3%	18.7%			
Asian (n = 71)	84.9%	15.1%			
Native Hawaiian/Pacific Islander (n = 42)	81.7%	18.3%			
American Indian/Alaskan Native (n = 74)	66.3%	33.7%			
Military Grade, Enlisted			49.29	< 0.001	5.17 (2.88–9.28)
Enlisted	79.0%	21.0%			
Officer	95.1%	4.9%			
	M ± SD	**M ± SD**	***t***	**P**	**Cohen *d***
Age, y	27.07 ± 6.07	27.86 ± 6.20	3.28	< 0.001	0.13
Number of times married	0.81 ± 0.69	0.93 ± 0.73	4.64	< 0.001	0.17
Number of children [a]	1.13 ± 1.44	1.43 ± 1.63	4.74	< 0.001	0.28
Months in military	61.52 ± 57.57	73.02 ± 57.94	5.06	< 0.001	0.20
Number of times deployed [b]	1.06 ± 1.08	1.43 ± 1.07	8.91	< 0.001	0.34

Due to data missing at random, sample size varied slightly for the No Insomnia Group (n = 3,189–3,271) and Insomnia Group (n = 788–809) for variables without subgroups, depending on the variable. Percentages represent percent of the group (No Insomnia vs. Insomnia) with the demographic characteristic. No Insomnia = ISI ≤ 14; Insomnia = ISI ≥ 15. Not Applicable = N/A. Cohen *d* = effect size: small = 0.2, medium = 0.5, large = 0.8. [a] *t*-test based on equal variances not assumed. [b] Number of deployments is actually a truncated variable, with the highest category scored "4" actually being "4 or more."

simple logistic regression was performed, with insomnia (yes or no) entered as the dependent variable and significant variables from the chi-square, analysis of variance, and adjusted logistic regression analyses entered simultaneously as the predictor variables. In instances where there were dichotomous and continuous versions of certain predictors (e.g. PCL-M score vs. PTSD diagnosis) that were significantly related in earlier analyses, we elected to use the dichotomous versions of these variables for ease of interpretation. Similarly, when the predictors were continuous demographic characteristics (e.g., age, number of children, number of times married), a simple median split was used. Subscale scores for measures were used if prior analyses had examined both subscale scores and total scores in order to avoid problems with multicollinearity. Effect sizes, odds ratios (ORs), and confidence intervals of various outcomes can be found in Table 1 through Table 6.

RESULTS

Prevalence of Insomnia

The mean total score of the ISI for the total sample was 7.97 (SD = 6.98), which is on the border of the standard cutoff score of 7 to distinguish between "No Insomnia" and "Subclinical Insomnia."[11] The single sleep items of the PCL-M and PHQ-9 showed only medium correlations with the ISI (r = 0.71 and r = 0.64, respectively, Ps < 0.05), suggesting modest to poor construct validity for these items. Using standard classification levels,[11] the ISI classified 54.3% of the sample as having No Insomnia, 25.8% as Subthreshold Insomnia, 15.5% as Clinical Insomnia-Moderate, and 4.4% as Clinical Insomnia-Severe. As discussed previously, participants were then dichotomized into a No Insomnia Group (80.1 % (n = 3,286); i.e., ISI ≤ 14 [No and Subthreshold Insomnia]) and an Insomnia Group (19.9% (n = 815); i.e., ISI ≥ 15 [Clinical Insomnia-Moderate and Severe).[17]

Correlates of Insomnia

Demographics

Table 2 shows the prevalence of insomnia within demographic groups. As can be seen in Table 2, there were no significant differences between the No Insomnia and Insomnia Groups on sex or ethnicity. There were significant differences among races, with the American Indian/Alaskan Native group having significantly higher rates of insomnia than Caucasians (OR = 2.11; 95% confidence interval [CI] = 1.36–3.26), other (OR = 2.25; 95% CI = 1.37–3.58), African Americans (OR = 1.86; 95% CI = 1.17–2.98), Asians (OR = 2.85; 95% CI = 1.38–5.90), and Native Hawaiian or Other Pacific Islanders (OR = 2.27; 95% CI = 1.09–4.73). There were also significant differences between military grades, with enlisted personnel having significantly higher rates of insomnia than officers. In addition,

Table 3—Univariate analyses of self-reported psychosocial and sleep variables for Insomnia and No Insomnia.

	No Insomnia		Clinically Significant Insomnia		ANOVA		
	M	(SD)	M	(SD)	*t*	P	Cohen *d*
PTSD (PCL-M) [a]	26.19	(11.26)	43.45	(15.14)	30.13	< 0.001	1.88
Depression (BDI-II)	5.33	(6.69)	16.55	(10.91)	36.86	< 0.001	1.24
Anxiety (BAI)	4.70	(7.22)	15.60	(12.52)	32.61	< 0.001	1.07
Resilience (RSES)	67.43	(12.57)	62.57	(14.13)	9.53	< 0.001	0.36
Anger (STAXI)	14.21	(6.20)	17.15	(8.14)	11.31	< 0.001	0.41
Alcohol use disorder (AUDIT)	4.64	(4.36)	6.77	(6.55)	11.18	< 0.001	0.38
Stressful life events (PERI)	6.01	(6.85)	13.64	(11.00)	24.84	< 0.001	0.83
Childhood emotional abuse (CTQ)	8.03	(4.03)	10.23	(5.15)	13.12	< 0.001	0.48
Childhood physical abuse (CTQ)	8.55	(3.93)	10.58	(5.09)	12.38	< 0.001	0.45
Childhood sexual abuse (CTQ)	6.24	(3.36)	7.03	(4.29)	5.66	< 0.001	0.21
Childhood emotional neglect (CTQ) [a]	10.99	(5.40)	12.96	(5.51)	9.13	< 0.001	0.52
Childhood physical neglect (CTQ)	8.71	(3.71)	10.42	(4.18)	11.39	< 0.001	0.43
Childhood minimization/denial (CTQ)	0.59	(0.91)	0.37	(0.73)	6.25	< 0.001	0.27
Social support-appraisal (ISEL-SF)	13.14	(2.57)	11.85	(2.86)	12.48	< 0.001	0.47
Social support-belonging (ISEL-SF)	13.19	(2.43)	12.23	(2.64)	9.90	< 0.001	0.38
Social support-tangible (ISEL-SF) [a]	12.89	(2.44)	11.87	(2.58)	10.16	< 0.001	0.59
Social support-total (ISEL-SF) [a]	39.23	(6.52)	35.96	(6.98)	12.11	< 0.001	0.70
Horizontal cohesion (WRAIR)	9.97	(3.06)	8.43	(3.26)	12.56	< 0.001	0.49
Vertical cohesion (WRAIR) [a]	41.43	(9.93)	35.81	(10.02)	14.28	< 0.001	0.81
Total cohesion (WRAIR) [a]	51.39	(11.98)	44.23	(12.18)	15.00	< 0.001	0.85
Health problems (PHQ-total)	3.27	(3.32)	7.81	(4.43)	31.78	< 0.001	1.16

Sample size varied slightly for the No Insomnia Group (n = 3,179–3,283) and Insomnia Group (n = 796–815), depending on the variable. ANOVA, analysis of variance; AUDIT, Alcohol Use Disorders Identification Test; BAI, Beck Anxiety Inventory total; BDI-II, Beck Depression Inventory-II (minus insomnia item); CTQ, Childhood Trauma Questionnaire (various subscales); ISEL-SF, Interpersonal Support Evaluation List-Short Form (various subscales); PCL-M, PTSD Checklist-Military Version (minus insomnia item); PERI, Psychiatric Epidemiology Research Interview Life Events Scale-Brief; PHQ-total, Patient Health Questionnaire (minus insomnia and menstrual problems items); PTSD, posttraumatic stress disorder; RSES, Response to Stressful Experiences Scale; SD, standard deviation; STAXI, State Anger Inventory; WRAIR, Walter Reed Army Institute of Research Horizontal and Vertical Cohesion Scales. Cohen *d* = effect size: small = 0.2, medium = 0.5, large = 0.8. [a] *t*-test based on equal variances not assumed.

the Insomnia Group was significantly older, had been married more times, had more children, had served longer in the military, and had more military deployments.

Mental and Physical Health Variables

The univariate analyses of self-reported psychosocial and sleep variables for the Insomnia and No Insomnia Groups are included in Table 3. As expected, service members in the Insomnia Group reported greater symptom severity of self-reported PTSD, depression, anxiety, anger, and alcohol use problems as compared to the No Insomnia Group. They also reported more stressful life events in the past 6 mo, greater childhood abuse, and lower levels of trait resilience, social support, and unit cohesion than the No Insomnia Group.

The prevalence of insomnia in groups with and without comorbid physical and mental health problems is included in Table 4. The prevalence of insomnia was higher in those with a history of head injuries (41.0% vs. 17.2%), clinically significant PTSD (50.7% vs. 11.4%), anxiety (57.0% vs. 13.4%), depression (64.0% vs. 13.1%), and alcohol usage (31.5% vs. 16.5%) than those without clinically significant levels of these difficulties. These differences stayed significant even after controlling for all other significant demographic variables and comorbid problems. The prevalence of insomnia was also significantly higher in individuals with any clinically significant medical symptom (38.2% to 69.8% vs. 14.4% to 19.7%), but after controlling for all other significant demographic variables and comorbid problems, statistical significance remained only in those individuals experiencing clinically significant back pain (OR = 1.36; 95% CI = 1.06–1.74), extremity pain (OR = 1.59; 95% CI = 1.25–2.02), headaches (OR = 1.83; 95% CI = 1.34–2.51), and fatigue (OR = 2.54; 95% CI = 1.93–3.34).

The prevalence of comorbid physical and mental health problems in the Insomnia and No Insomnia Groups is included in Table 5. The Insomnia Group had higher rates of head injuries (23.20% vs. 8.3%) and clinically significant PTSD (55.5% vs. 13.5%), anxiety (42.7% vs. 8.0%), depression (42.4% vs. 5.9%), and alcohol use disorder (35.6% vs. 19.2%) than the No Insomnia Group. These differences stayed significant even after controlling for all other significant demographic variables and comorbid problems. The prevalence of all clinically significant medical symptoms was also significantly higher in Insomnia than No Insomnia (1.4% to 42.3% vs. 0.3% to 15.7%), but after controlling for all other significant demographic variables and comorbid problems, statistical significance remained only for significant back pain (OR = 1.40; 95% CI = 1.10–1.78),

Table 4—Prevalence of insomnia in groups with and without comorbid physical and mental health problems.

Comorbid Problem	Prevalence of Insomnia: In People Without Comorbid Problem	Prevalence of Insomnia: In People with Comorbid Problem	Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)[a]
Head injuries	17.2%	41.0%	3.35 (2.73–4.11)[d]	1.43 (1.07–1.90)[c]
PTSD	11.4%	50.7%	7.99 (6.72–9.49)[d]	2.39 (1.88–3.04)[d]
Anxiety	13.4%	57.0%	8.55 (7.09–10.31)[d]	1.93 (1.46–2.55)[d]
Depression	13.1%	64.0%	11.77 (9.62–14.39)[d]	2.89 (2.17–3.85)[d]
Alcohol use disorder	16.5%	31.5%	2.32 (1.97–2.75)[d]	1.57 (1.25–1.96)[d]
Medical symptoms				
Stomach pain	19.0%	43.2%	3.24 (2.23–4.71)[d]	0.97 (0.54–1.72)
Back pain	15.2%	38.2%	3.45 (2.91–4.08)[d]	1.36 (1.06–1.74)[c]
Extremity pain	14.5%	40.0%	3.94 (3.33–4.67)[d]	1.59 (1.25–2.02)[d]
Headaches	16.8%	51.6%	5.26 (4.19–6.59)[d]	1.83 (1.34–2.51)[d]
Chest pain	19.2%	54.2%	4.65 (2.99–7.23)[d]	0.97 (0.49–1.88)
Dizziness	19.2%	57.4%	5.66 (3.48–9.22)[d]	1.06 (0.51–2.21)
Fainting spells	19.7%	50.0%	4.08 (1.76–9.45)[d]	0.48 (0.13–1.87)
Heart palpitations	18.4%	69.8%	10.25 (6.84–15.36)[d]	1.44 (0.78–2.65)
Shortness of breath	18.9%	58.3%	5.99 (3.96–9.06)[d]	0.99 (0.50–1.96)
Intercourse problems	19.3%	68.2%	8.97 (4.74–17.01)[d]	2.35 (0.97–5.66)
Gastrointestinal problems	18.9%	45.5%	3.57 (2.54–5.01)[d]	0.65 (0.37–1.16)
Nausea, gas, indigestion	18.5%	51.2%	4.62 (3.39–6.31)[d]	1.12 (0.67–1.88)
Fatigue	14.4%	57.6%	8.09 (6.64–9.85)[d]	2.54 (1.93–3.34)[d]

Due to data missing at random, sample size varied slightly for the No Insomnia Group (n = 3,266–3,386) and Insomnia Group (n = 797–815), depending on correlate variable. *df* = 1 for all analyses. CI = confidence interval; PTSD = posttraumatic stress disorder. [a] Adjusted for all military grade, age, number of times married, number of children, months in military, number of times deployed, all other significant comorbid problems in this table. [b] $P < 0.05$. [c] $P < 0.01$. [d] $P < 0.001$.

extremity pain (OR = 1.61; 95% CI = 1.27–2.04), headaches (OR = 1.92; 95% CI = 1.41–2.61), heart palpitations (OR = 2.22; 95% CI = 1.22–4.07), intercourse problems (OR = 3.02; 95% CI = 1.22–7.48), and fatigue (OR = 2.75; 95% CI = 2.10–3.60).

Predictors of Insomnia

The predictors from simultaneous logistic regression analysis for variables predicting insomnia are included in Table 6. The overall regression model (n = 3,862) with all 36 originally significant predictors of insomnia was significant ($\chi^2(8) = 46.71$, $P < 0.001$), with Nagelkerke R^2 indicating that 39.20% of the variation in insomnia was accounted for by the predictors. As Table 6 shows, 14 of the original 36 variables remained significant, including PTSD, depression, fatigue, stressful life events, headaches, anxiety, alcohol use problems, extremity pain, history of head injury, vertical cohesion, childhood physical neglect, back pain, number of times married, and tangible social support.

DISCUSSION

This study evaluated a large sample of active-duty US military personnel (n = 4,101) prior to deploying to locations in and around Iraq and Afghanistan. The results indicated that almost one out of five service members (19.9%) met criteria for insomnia using a conservative cutoff (≥ 15) on the seven-item ISI. Rates of insomnia were more than five times as likely in enlisted personnel (21.0%) as compared to officers (4.9%). Insomnia was also higher in American Indian/Alaskan Native than in all other groups (33.7% vs. 15.1% to 21.4%; all Ps < 0.05), although this minority group represented only 2.3% of the sample population. The Insomnia Group was also older, had been married more times, had more children, had been in the military longer, and had more military deployments (all Ps < 0.001). The Insomnia Group reported greater symptom severity of PTSD, depression, anxiety, anger, alcohol use problems, medical symptoms, more stressful life events in past 6 mo, more childhood abuse, and lower levels of resilience, minimization/denial of childhood abuse, social support and unit cohesion than the No Insomnia Group (all Ps < 0.001).

Similarly, individuals in the Insomnia Group were more likely than the No Insomnia Group to report a history of head injuries, clinically significant PTSD, anxiety, depression, or alcohol use problems, back pain, extremity pain, headaches, heart palpitations, intercourse problems, and fatigue (ORs = 1.40–3.30). After controlling for all other significant demographics and comorbid problems, individuals with a history of head injuries, clinically significant PTSD, anxiety, depression, or alcohol use problems, back pain, extremity pain, headaches, and fatigue were more likely (ORs = 1.36–2.89) to report insomnia.

Although numerous variables predicted insomnia status individually, the final logistic regression showed that, holding all other predictors constant, PTSD, depression, fatigue, stressful life events, headaches, anxiety, alcohol use problems,

Table 5—Prevalence comorbid physical and mental health problems in Insomnia vs. No Insomnia Groups.

Comorbid Problem	Prevalence of Comorbid Problem		Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)[a]
	In No Insomnia Group	In Insomnia Group		
Head injuries	8.3%	23.2%	3.35 (2.73–4.11)[d]	1.55 (1.17–2.05)[c]
PTSD	13.5%	55.5%	7.99 (6.72–9.49)[d]	2.37 (1.86–3.00)[d]
Anxiety	8.0%	42.7%	8.55 (7.09–10.31)[d]	2.07 (1.57–2.71)[d]
Depression	5.9%	42.4%	11.77 (9.62–14.39)[d]	3.30 (2.49–4.37)[d]
Alcohol use disorder	19.2%	35.6%	2.32 (1.97–2.75)[d]	1.52 (1.21–1.90)[d]
Medical symptoms				
Stomach pain	2.1%	6.4%	3.24 (2.23–4.71)[d]	1.12 (0.64–1.96)
Back pain	15.7%	39.1%	3.45 (2.91–4.08)[d]	1.40 (1.10–1.78)[c]
Extremity pain	15.7%	42.3%	3.94 (3.33–4.66)[d]	1.61 (1.27–2.04)[d]
Headaches	5.2%	22.4%	5.26 (4.19–6.59)[d]	1.92 (1.41–2.61)[d]
Chest pain	1.2%	5.3%	4.65 (2.99–7.23)[d]	1.20 (0.67–2.31)
Dizziness	0.9%	4.8%	5.67 (3.48–9.22)[d]	1.19 (0.56–2.53)
Fainting spells	0.3%	1.4%	4.08 (1.76–9.45)[d]	1.06 (0.18–6.40)
Heart palpitations	1.1%	10.0%	10.25 (6.84–15.36)[d]	2.22 (1.22–4.07)[c]
Shortness of breath	1.2%	6.9%	5.99 (3.96–9.06)[d]	1.24 (0.63–2.44)
Intercourse problems	0.4%	3.7%	8.97 (4.74–17.01)[d]	3.02 (1.22–7.48)[b]
Gastrointestinal problems	2.4%	8.0%	3.57 (2.54–5.01)[d]	0.69 (0.39–1.21)
Nausea, Gas, Indigestion	2.5%	10.7%	4.62 (3.39–6.31)[d]	1.20 (0.72–2.00)
Fatigue	6.8%	37.0%	8.09 (6.64–9.85)[d]	2.75 (2.10–3.60)[d]

Note. Due to data missing at random, sample size varied slightly for the No Insomnia Group (n = 3,266–3,386) and Insomnia Group (n = 797–815), depending on correlate variable. *df* = 1 for all analyses. CI = confidence interval; PTSD, posttraumatic stress disorder. [a] Adjusted for all military grade, age, number of times married, number of children, months in military, number of times deployed, all other significant comorbid problems in this table. [b] $P < 0.05$. [c] $P < 0.01$. [d] $P < 0.001$.

extremity pain, history of head injury, vertical cohesion, childhood physical neglect, back pain, number of times married, and tangible social support remained statistically significant predictors of insomnia status.

As hypothesized, the 19.9% prevalence rate for insomnia found in this study using the ISI was lower than the 25% that Seelig and colleagues[6] found in the largest military sample (n = 41,225) of individuals predeployment using single self-report items. Rates were also lower than the 35% that Bryan[5] found using the same ISI criteria (i.e., ISI total score ≥ 15) in a military traumatic brain injury clinic in Iraq, but they were higher than the 16% found in the Morrow et al.[7] study of para-rescuemen. Rates found in the current study were also lower than the 25% that Mysliwiec et al.[2] found using gold standard sleep specialist diagnosis and PSG in a military sleep disorders clinic, but they were similar to the 20% that Collen et al.[4] found in service members with a blunt trauma history at a military traumatic brain injury clinic in the US. Finally, the 19.9% found here was higher than the 13% that Morin et al.[17] found in a civilian sample using the same criteria (i.e., ISI total score ≥ 15). The prevalence estimates found in the current study were likely lower than most previous military studies because (1) a validated measure with a conservative case definition was used to assess insomnia, rather than a single item, and (2) a large population of military service members was assessed prior to deployment, rather than a medical sample. The rates found here were likely higher than the Morrow et al.[7] study because they had a smaller (N = 140), healthier sample, as evidenced by their lower PTSD and depression rates than previous studies, which likely contributed to lower insomnia rates. Overall, these data affirm that insomnia is highly prevalent in the military, affecting approximately one in five service members.

This study was unique in part because it included a racially and ethnically diverse sample, allowing the first examination of the prevalence of insomnia in the military using National Institutes of Health definitions[41] of race and ethnicity. The findings that the American Indian/Alaskan Native group had significantly higher rates of insomnia (40.3%) than all other groups was unexpected only in that very little research has been performed on this group. One study of a small sample (N = 449) of older (age 55 y and older) American Indians found that approximately 40% reported "Sometimes" having "difficulty falling asleep or staying asleep" and 16.6% reported "Often" having this problem.[42] An unpublished dissertation[43] reported that 25% of an adolescent American Indian/Alaskan Native group reported insomnia defined as "trouble falling asleep or staying asleep at least once a week." They went on to show that insomnia was significantly related to depression but not suicide. The nonsignificant differences between the other racial and ethnic backgrounds were not altogether unexpected, as this literature has been mixed. Although one meta-analysis found differences between non-Hispanic whites and African Americans on symptoms of insomnia,[44] other studies have found that these differences are primarily found in middle-aged adults and women,[45–47] both of which were

Table 6—Predictors from simultaneous logistic regression analysis for variables predicting insomnia.

Predictor Variable (Measure)	B	SE B	Wald	P	Odds Ratio	95% CI Lower	95% CI Upper
Constant	0.03	0.34	0.01	0.930	1.03		
PTSD	0.80	0.12	44.43	< 0.001	2.22	1.75	2.80
Depression	0.89	0.14	38.93	< 0.001	2.43	1.84	3.22
Fatigue	0.84	0.14	37.68	< 0.001	2.31	1.77	3.01
Stressful life events	0.60	0.11	29.82	< 0.001	1.82	1.47	2.26
Headaches	0.72	0.16	21.59	< 0.001	2.06	1.52	2.79
Anxiety	0.51	0.14	13.22	< 0.001	1.66	1.26	2.18
Alcohol use disorder	0.39	0.11	12.12	< 0.001	1.48	1.19	1.84
Extremity pain	0.39	0.12	10.74	0.001	1.48	1.17	1.87
Head injury	0.44	0.14	9.33	0.002	1.55	1.17	2.05
Vertical cohesion	−0.31	0.11	7.20	0.007	0.74	0.59	0.92
Childhood physical neglect	0.29	0.12	5.45	0.020	1.33	1.05	1.70
Back pain	0.26	0.12	4.80	0.029	1.30	1.03	1.65
Number of times married	0.30	0.14	4.38	0.036	1.35	1.02	1.79
Tangible social support	−0.27	0.13	4.14	0.042	0.77	0.59	0.99
Gastrointestinal issues	−0.53	0.28	3.67	0.055	0.59	0.34	1.01
Intercourse problems	0.84	0.44	3.60	0.058	2.32	0.97	5.54
Anger	0.17	0.10	2.83	0.093	1.19	0.97	1.45
Childhood sexual abuse	−0.22	0.14	2.48	0.115	0.80	0.61	1.05
Childhood physical abuse	0.15	0.12	1.51	0.219	1.16	0.92	1.46
Number of months in military	0.13	0.14	0.84	0.360	1.14	0.86	1.49
Heart palpitations	0.26	0.30	0.79	0.374	1.30	0.73	2.33
Childhood emotional abuse	0.11	0.13	0.75	0.387	1.12	0.87	1.43
Fainting spells	−0.50	0.64	0.61	0.436	0.61	0.17	2.14
Number of times deployed	−0.09	0.14	0.45	0.502	0.91	0.70	1.19
Nausea, gas, indigestion	0.17	0.25	0.43	0.511	1.18	0.72	1.95
Horizontal cohesion	−0.08	0.12	0.41	0.523	0.93	0.74	1.17
Childhood emotional neglect	−0.07	0.13	0.34	0.562	0.93	0.72	1.19
Age	−0.07	0.12	0.32	0.571	0.93	0.73	1.19
Resilience	0.05	0.10	0.24	0.626	1.05	0.86	1.29
Belongingness	−0.05	0.12	0.18	0.674	0.95	0.74	1.21
Dizziness	−0.08	0.35	0.05	0.818	0.92	0.46	1.83
Stomach pain	−0.06	0.28	0.05	0.832	0.94	0.54	1.64
Shortness of breath	−0.07	0.33	0.04	0.841	0.94	0.49	1.78
Number of children	−0.02	0.11	0.02	0.876	0.98	0.79	1.23
Appraisal social support	0.01	0.13	0.00	0.956	1.01	0.78	1.30
Chest pain	0.01	0.32	0.00	0.974	1.01	0.54	1.88

n = 3,862. For ease of interpretation, continuous demographic variables of number of times married, age and number of children were transformed to dichotomous variables with a median split. Gray area highlights statistically significant predictors. CI, confidence interval; PTSD, posttraumatic stress disorder.

underrepresented in the current study (i.e., only 4.8% older than 40 y and 8.8% female).[48]

This current study replicated previous studies showing that the number of military deployments is highly related to insomnia.[1,6,49] With respect to other demographic factors, the results were consistent with previous studies in civilian samples showing that insomnia is related to increasing age,[50,51] but this was the first study to demonstrate this relationship in a military sample. This study was also the first to identify that military personnel with insomnia had been married more times, had more children, and had been in the military longer. The previous finding from Mysliwiec et al.[2] indicating higher rates of insomnia among women than among men was not replicated. It is unclear why this result was not found, especially given it is a consistent finding in civilian samples,[52] but it may be related to women in the military being healthier, having better access to health care, and being less likely to engage in health risk behaviors than civilian women.[48]

The results of this study replicated those from previous studies showing insomnia is related to a history of head

injuries,[3,5] PTSD,[2,5,6,53] depression,[2,6] anxiety,[2,6] and problematic drinking[6] in active duty service members. The results also replicated results from studies of civilian samples with regard to levels of anger,[18] exposure to potentially traumatizing events during one's lifetime[54] or childhood,[20,21] trait resilience,[20] social support,[22] and marital status.[23] Finally, this was the first study to demonstrate that service members with insomnia reported lower levels of unit cohesion, which likely reduces resilience against a wide array of stressors that may impact sleep.[24,25]

The rates of insomnia in those with a history of head injury in the current study (41.0%) were in line with those reported by Bryan[5] and Hoge et al.[3] (i.e., 50.0% to 53.8%). The rates of clinically significant anxiety and depression in the Insomnia Group were twice the rates seen in some civilian samples (42.7 and 42.4% vs. 19.3 and 20.0%, respectively).[13] The rates of clinically significant problems in the Insomnia Group were greater than those found by Mysliwiec et al.[2] for PTSD (55.5% vs. 20.7%, respectively), depression (42.4% vs. 31.4%, respectively), and anxiety (42.7% vs. 23.4%, respectively), but less for head injuries (23.2% vs. 31.9%, respectively). The rest of the results were new findings in this sample and were in line with the overall pattern of results of the Insomnia Group having worse functioning than the No Insomnia Group.

Finally, logistic regressions were run predicting insomnia to address the issue of symptom overlap among the many constructs measured (e.g., insomnia, depression, PTSD, medical problems). Consistent with other research in civilian samples, PTSD,[55–59] depression,[12,13,60–70] and medical problems[10,71] (i.e., fatigue, headaches, extremity pain, history of head injury, back pain) strongly predicted insomnia status.[12,27] Additional predictors included stressful life events, anxiety, alcohol use problems, vertical cohesion, childhood physical neglect, number of times married, and tangible social support. This is not to imply that insomnia is necessarily secondary to these problems, as research has begun to show that insomnia often has a reciprocal relationship with these and other problems.[12,13,16] For instance, there is now substantial evidence that insomnia is involved in the development and course of depression[12,13,60–70] and PTSD.[56,59] Sleep disturbances may also serve to exacerbate many medical problems such as pain,[72–74] cardiovascular disease,[75–77] and gastrointestinal problems.[78] However, one can safely assume that when the risk of having insomnia is more than twofold greater in a particular comorbidity (e.g., depression, PTSD, anxiety) the comorbidity is likely causing some portion of the insomnia. More prospective, experimental, and intervention research is needed to help clarify these relationships if precision medicine is going to become a reality.

One limitation of the current study was that insomnia status was characterized with a self-report scale rather than a structured clinical interview performed by an expert in sleep medicine. Although not as rigorous as those provided by the DSM-5[79] or the quantitative[80] or Research Diagnostic Criteria,[81] the ISI has excellent reliability and validity. It also is a significant improvement over the single items from the PCL and PHQ more commonly used in this population[1,3,6] and comparable to those used by Bryan[5] and Morrow et al.[5] Within a large-scale study such as this, which included some occurrences in which hundreds of service members were screened per day as they were preparing for deployment, it is difficult to perform structured clinical interviews of the kind needed to reliably assess diagnostic criteria as described previously. Thus the ISI or similar diagnosis-specific measures, rather than nonspecific single items, might be the next best option.

Another limitation of the current study was that a cross-sectional sample of convenience was employed. Therefore, the results are not generalizable to all service members, the direction of the association between insomnia and the various correlates is unknown, and the intra-individual temporal courses or trajectories of insomnia are also not known (e.g., the percentage of cases that spontaneously remit is unknown). However, these data do improve our understanding of the prevalence and correlates of insomnia in the Army, using a better assessment of insomnia in a more general sample, which hopefully will stimulate prevention and treatment strategies.[82] Future studies should investigate insomnia in other branches of the military.

This study was also limited because all the active-duty service members included in this sample were preparing to deploy. The stress associated with this situation may have altered sleep. However, active-duty service members experience a number of stressful transitions (e.g., changes in duty assignments and duty stations). The degree to which preparing to deploy differentially affects sleep compared to other transitions is unknown.

Notwithstanding these problems, these findings are consistent with a growing body of literature showing that insomnia is an important public health problem in active-duty military and highlight the importance of assessing and addressing insomnia in this population. Larger-scale longitudinal studies are needed, as a great deal remains to be learned about prevalence and temporal relationships of sleep disorders (e.g., insomnia, apnea, shift work, sleep deprivation) and correlates and comorbidities in the military. In addition, more studies are needed to help determine how best to treat those individuals with insomnia in the unique work culture of the military.

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DISCLOSURE STATEMENT

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