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Sleep and Fatigue Issues in Continuous Operations: A Survey of U.S. Army Officers

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Forty-nine U.S. Army officers with recent combat experience were surveyed to assess their units' sleep patterns and to determine the tactics, techniques, and procedures used to counter the effects of sleep deprivation in their units. Despite Army policy requiring units to develop and implement sleep management plans, nearly 80% of the participants reported they had not been briefed on a sleep management plan during their most recent deployment. Over one half of the respondents reported that fatigue was a problem in their units. During high operational tempo (OPTEMPO), which occupied nearly half of their time in combat, participants report receiving only 4 hr of sleep daily. The vast majority of respondents (82.6%) reported feeling sleep-deprived at least occasionally while at high OPTEMPO. These findings have important implications for the operational readiness of all military units deployed to combat environments.

The demands of modern-day life contribute to work schedules whereby humans chronically fail to get adequate amounts of nightly sleep (Dement & Vaughan, 1999). Over the past century, research indicates that Americans get significantly less sleep than did our forebears: on average, over 2 hr less sleep per night. This alarming trend is even more prevalent among professions requiring around-the-clock operations, such as emergency response teams and members of the military forces. Professionals in these fields are faced with both acute and chronic sleep deprivation, resulting in a sleep debt that undoubtedly affects their performance and safety. Cutbacks in military spending—and the desire to do more with less—have led to increased pressure for military personnel to work longer hours with less time off, and increased operational tempo (OPTEMPO). This term, referring to the pace of military missions (Department of the Army, 1996), can be interpreted as the military equivalent of workload, and it is known to affect soldier and unit performance (Castro & Adler, 1999; Thomas, Adler, & Castro, 2005). Problems from excessive workload are further exacerbated by the dangerous

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combat environments and poor sleeping conditions faced by members of the U.S. military when engaged in combat operations.

The effects of sleep deprivation on performance are well documented in the scientific literature (Belenky et al., 2003; Van Dongen, Maislin, Mullington, & Dinges, 2003). In fact, the performance degradation from sleep deprivation has been likened to that experienced by alcohol intoxication (Dawson & Reid, 1997). In particular, psychomotor vigilance is dramatically altered when sleep is restricted. Vigilance is crucial for many military tasks including watch-standing and tactical operations. When vigilance is degraded, important information is invariably missed, placing both service members and the mission at greater risk of failure.

Harrison and Horne (2000) reviewed the effects of sleep deprivation on a wide range of cognitive activities, including decision making. They pointed out that senior mangement and military leaders are often required to work extended hours during times of crisis, making high-level decisions in complex, dynamic, and dangerous environments. The sleep deprivation experienced by these decision makers may not not affect complex, rule-based, logical task performance—perhaps due to heightened interest and compensatory efforts by participants. However, they concluded that sleep deprivation does affect decisions that involve creative solutions, dynamic replanning, managing competing demands, and complex communications—all critical macrocognitive activities inherent in military environments. Harrison and Horne discussed the critical role of the prefrontal cortex in tasks of this nature, and suggested that sleep deprivation "presents particular difficulties for sleep-deprived decision makers who require these latter skills during emergency situations" (p. 236). Other recent studies have also linked sleep deprivation to altered electrical activity in the prefrontal cortex, adding credence to this argument and offering a physiological rationale to explain macrocognitive changes.

The effects of fatigue are insidious. Humans, especially sleep-deprived ones, are not adept at judging when their performance is impaired. There is an attitude among those in the military that may actually contribute to sleep deprivation by encouraging stoic denial of the need for sleep (Davenport & Lee, 2007; Shay, 1998). A study conducted at the National Training Center found that the amount of sleep received was inversely proportional to rank, indicating that senior leadership received even less sleep than those junior to them (Belenky, 1997). Sleep-deprived leaders appear to have a diminished capacity to recognize their own sleep debt, as well as the sleep debt of their subordinates. Instead, these leaders need strategies for effective fatigue mitigation and fatigue countermeasure guidance that can be implemented easily.

Army regulations address sleep-related issues as part of combat and operational stress and battle fatigue (a military term for combat stress symptoms and reactions; Department of the Army, 2009). Military leaders are required to focus their efforts on their units' operational stress management. The following list of suggested fatigue countermeasures is routinely given to commanders: encourage napping, provide quiet and dark rest areas, and use of stimulants (caffeine). Commanders are advised to be cautious with sleep-inducing agents given the consequent performance impairment that these agents may induce. Appropriate scheduling of shift work is another method to maintain unit performance during operations (Department of the Army, 2009). Before deployment, sleep and fatigue issues are always a concern for the chain of command, and military leaders are advised at staff meetings to enforce sleep management plans for their units.

This article reports the results of a survey of self-reported sleep and napping patterns, OPTEMPO, and stress of U.S. Army officers recently returned from deployments to Iraq or

Afghanistan. The focus of the study is on two areas: the sleep patterns of individual soldiers and military units engaged in continuous operations; and, the tactics, techniques, and procedures used by forward-deployed units to counter fatigue.

METHOD

Participants and Setting

This study focuses on sleep issues during military operations. The study respondents were recruited after consulting with the senior leadership at the Infantry Officer Advanced Course (IOAC) at Fort Benning, Georgia. Study participants were a convenience sample of 49 male returning combat-deployed Army officers enrolled in the IOAC. As reported by the school leadership, the distribution of IOAC attendees is representative of the larger deployed force of U.S. Army officers in terms of age, rank, and experience.

Instrument

The questionnaire was specifically constructed to evaluate the respondent's most recent combat deployment, and was composed of 13 questions. Three questions were open-ended, whereas the other 10 questions included numerical inputs, dichotomized inputs, or ratings on 5-point Likert-type scales. The questionnaire included the following sections:

1. Demographic information: age, rank, gender, Military Occupational Specialty, total years of service, commissioned years of service, and number and total length of all combat deployments.
2. Briefing on sleep management plan (yes or no).
3. Sleep issues related to the participant's unit: "My unit worked in shifts," "My unit encouraged and monitored naps," "My unit designated dark and quite areas for rest," and "My unit tried to enforce sleep schedules."
4. Fatigue and sleep routines management question: "Fatigue was a problem in my unit," and "My unit did a good job managing sleep routines."
5. OPTEMPO occurrence. The participant estimated the percentage of time spent in OPTEMPO level (high, moderate, or low) during last deployment.
6. Daily sleep question: Participant reported the average amount of daily sleep by OPTEMPO level.
7. Napping question: "In addition to one major sleep period, I took naps to get more sleep." Participants estimated the occurrence of napping by OPTEMPO level.
8. Sleep deprivation question: "How often did you experience sleep deprivation symptoms?" Input included frequency of occurrence for each OPTEMPO level.
9. Deployment issues question: Over the course of the deployment, "Sleep deprivation was a serious problem in your unit," "You were exposed to significant sources of stress," "You would characterize your stress level as very high," and "Compared to your normal life, you used more caffeinated drinks (coffee, soft drinks, or tea)."

10. Sleep evaluation question: "When I reflect on my own sleep patterns and the sleep patterns of the soldiers with whom I served throughout the entire deployment, I would characterize that sleep as...." Participants rated sleep quantity (their own, peers, superiors, and subordinates) on a 5-point scale ranging from 1 (*much less than needed*), 2 (*less than needed*), 3 (*about right*), 4 (*more than needed*), to 5 (*much more than needed*).
11. Three open-ended questions: "Indicate other things your unit did to address sleep issues," "Indicate positive factors that affected your unit's rest," and "Indicate negative factors that affected your unit's rest."

Questions 3, 4, and 7 to 9 were rated on a 5-point Likert scale ranging from 1 (*never*), 2 (*rarely*), 3 (*occasionally*), 4 (*sometimes*), to 5 (*all the time*).

Statistical Analysis

Answers to the survey questions were entered into a Microsoft Excel spreadsheet. Statistical analysis was conducted with Excel and JMP Release 7.0. Data normality was assessed with the Shapiro–Wilk W test. Initially, the data were analyzed for outliers. Analyses of variance (ANOVAs), chi-square analyses, and nonparametric tests were used when appropriate to assess the study responses. Statistical significance was indicated for two-tailed p values of $<.05$. The independent variables were OPTEMPO and whether participants had been briefed on a sleep management plan. The main dependent variables examined were self-reported sleep and napping, sleep deprivation symptoms and stress, and assessment of unit sleep issues.

Procedures

Study participants were volunteers who provided their informed consent after being briefed about the study. The survey was administered to the entire group of officers after they were informed of their right to decline participation. The study instrument and research protocol was accepted by the Infantry School leadership, and approved by the Naval Postgraduate School institutional review board. All participants were asked to fill out the study questionnaire.

RESULTS

Demographic Data

Two participants reported that they had never deployed to combat, whereas one participant reported having deployed 10 times in just 6 years of service (Mahalanobis outlier distance = 5.81). These 3 participants were excluded from further analysis. This article focuses on the remaining 46 participants. The average age of the study participants was 29.4 years ($SD = 4.4$, $Mdn = 28$); 6 of the respondents held the rank of first lieutenant, 38 were captains, and 2 were majors. The average length of time in military service was 8.1 years ($SD = 5.0$, $Mdn = 6.5$). The majority of the participants (71.1%) had only one deployment to combat, whereas the

remainder had more than one combat deployment (2 deployments: 20%; 3 deployments: 6.7%; and 4 deployments: 2.2%). On average, respondents reported that the total time they had deployed to combat was 15.5 months ($SD = 11.7$, $Mdn = 12.0$).

Sleep Plan

Approximately 80% of the participants in the study reported that they were not briefed on a sleep management plan during their most recent deployment (not briefed: $n = 37$, or 80.4%; briefed: $n = 9$, or 19.6%). Briefing status was independent of age, rank, length of total time in service, and length of commissioned service.

We also examined the extent to which the participants' units focused on sleep issues and on the use of countermeasures that could mitigate the impact of fatigue on individual and unit performance. We focused on participants' responses to known interventions used in military operations in order to reduce the deleterious effect of sleep deprivation: (a) shift-working, (b) encouraging and monitoring naps, (c) designating dark and quiet areas for rest, and (d) enforcing sleep schedules. The frequency of responses for these four survey items is shown in Figure 1. The percentage of participants is shown by the number at the top of each bar. For example, in Figure 1, 25% of the total number of those responding to this item answered "never" to whether their unit worked in shifts.

Of particular interest and concern is the large proportion of "never" or "rarely" answers in Figure 1. For example, 73.9% of the respondents reported that their unit never or rarely encouraged or monitored naps, whereas 66.7% of respondents reported that their unit never or rarely designated dark or quiet areas for rest. One half of the respondents (50%) answered that they had never, or rarely, tried to enforce sleep schedules, indicating that most units may not have openly addressed sleep issues.

We attempted to quantify the implementation of fatigue interventions during operations by combining the responses to the four questions (shift-working, napping, rest areas designation, and sleep schedules enforcement) to arrive at an overall metric, "sleep hygiene rating." (For this study, we use this term to refer only to these 4 sleep-promoting factors that are specifically mentioned in the existing Army regulations.) This sleep hygiene rating indicates the overall attention or emphasis placed on sleep issues by any given unit. The point values for each participant's response were summed across the four questions in this group, giving each participant an overall score. These scores ranged from 4 (the minimum value when all answers were "never") to 20 (the maximum value when all answers were "all the time"). For example, a respondent answering "rarely" to all four items would have an overall sleep hygiene rating of 8, whereas a participant responding "occasionally" to all four items would have a sleep hygiene rating of 12. Similarly, a respondent indicating "sometimes" to all four items would have a score of 16. Higher sleep hygiene ratings indicate that the unit was more attentive to sleep hygiene, whereas lower scores indicate that less attention was paid to unit sleep hygiene.

The results showed that participants' sleep hygiene ratings were related to whether or not they were briefed on a sleep management plan during their most recent deployment (Van der Waerden nonparametric test, 1-way chi-square approximation): $\chi^2(1, N = 44) = 2.7936$, $p = .09$; briefed: $n = 9$ ($M = 11.56$, $SD = 5.20$); not briefed: $n = 35$ ($M = 9.26$, $SD = 3.83$). Simply stated, units that briefed its members on sleep plans also engaged in

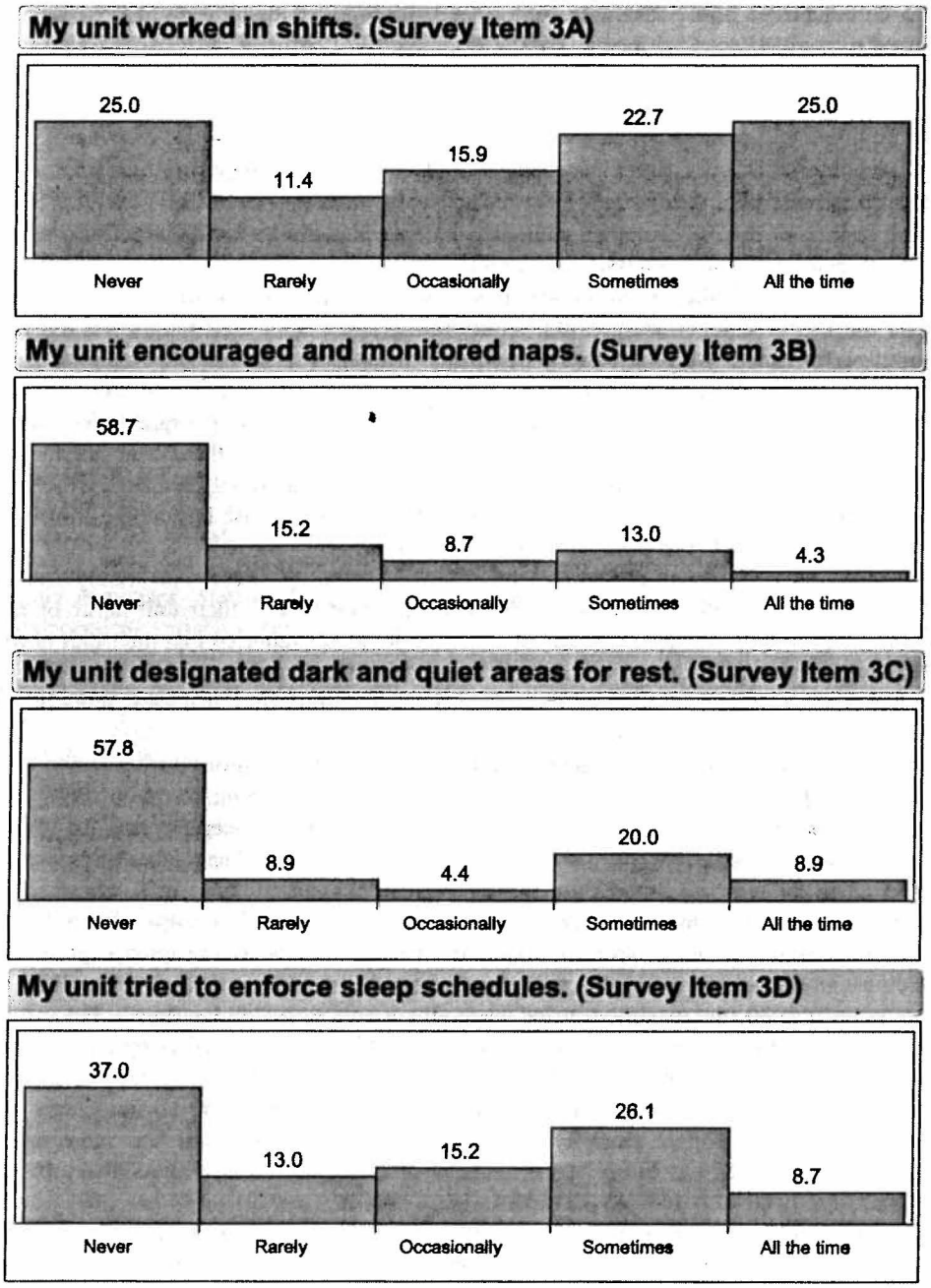

FIGURE 1 Frequency of answers regarding sleep hygiene and the use of fatigue countermeasures.

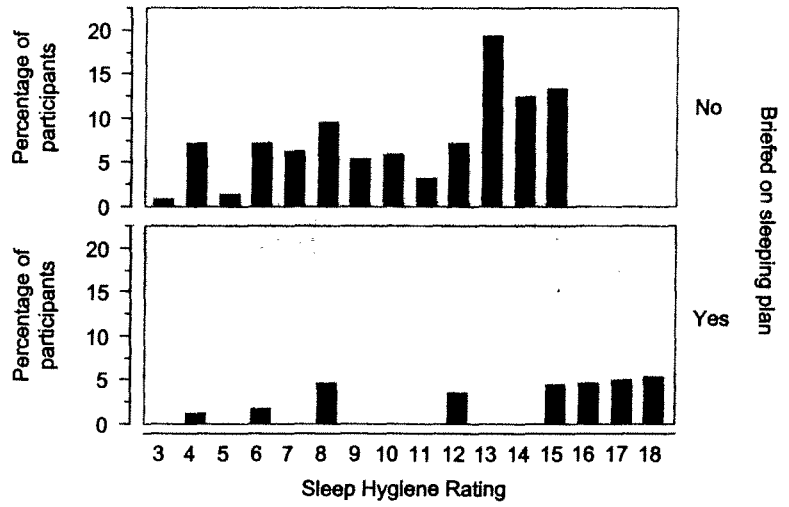

FIGURE 2 Frequency of overall sleep hygiene ratings as a function of sleep plan briefing status. *Note.* Higher ratings indicate better sleep hygiene.

other fatigue management practices. Figure 2 shows the frequency of the overall sleep hygiene rating, depending on whether or not the participants had been briefed on a sleep plan.

It is interesting to note that, although the participants who reported they had been briefed on a sleep plan generally had higher overall sleep hygiene ratings, 3 members of that group had very low overall sleep hygiene ratings. The specific type of units and the missions to which these individuals were assigned is unknown.

Overall Unit Fatigue and Sleep Management

The next section of the questionnaire asked respondents to rate their agreement with the statements that "fatigue was a problem" in their unit and that their unit "did a good job managing sleep routines." Although we were not able to collect objectively determined measures of sleep in these deployed units, these subjective answers represent individual assessments of fatigue severity and unit effectiveness with respect to sleep management. Figure 3 shows the responses to "Fatigue was a problem in my unit." A majority of respondents (over 55%) agreed or strongly agreed that fatigue was a problem in their unit.

Sleep plan briefing status was a significant determinant for participants' evaluation of whether their unit managed sleep routines well, $F(1, 43) = 9.0378$, $p = .004$ (Van der Waerden nonparametric test, 1-way chi-square approximation): $\chi^2(1, N = 45) = 7.5404$, $p = .006$). Nearly two thirds of participants (66%) who were briefed on a sleep plan agreed or strongly agreed that their unit did a good job managing sleep routines. This finding is in stark contrast to the responses of participants who did not receive sleep plan briefings; of those not receiving a sleep plan briefing, only 24.3% agreed that their unit did a good job managing sleep routines. Those respondents who received a sleep plan briefing were much more likely to agree that their unit did a good job managing sleep routines.

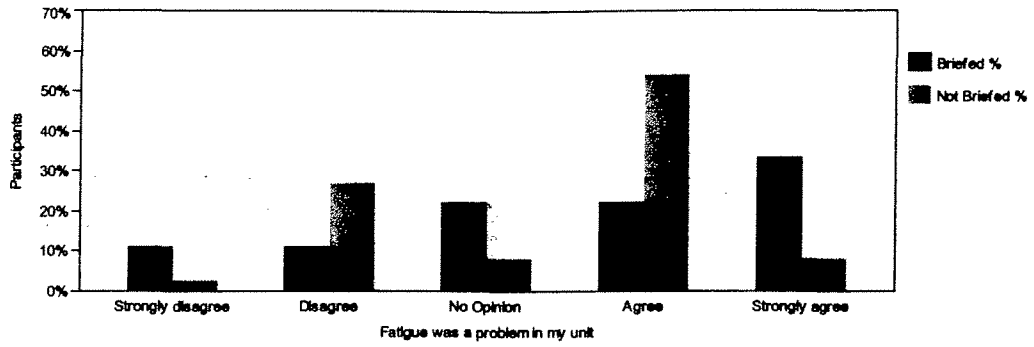

FIGURE 3 Frequency of responses to Survey Item 4A ("Fatigue was a problem in my unit") as a function of sleep plan briefing status.

Finally, participants indicating that their units did a good job at sleep routine management were those who placed an emphasis on sleep issues (as shown by increased sleep hygiene ratings: correlation, $r = .484$; $n = 43$; $p < .001$).

OPTEMPO

Participants were asked to estimate the percentage of time during their last deployment that they spent at high, moderate, or low OPTEMPO, based on their subjective assessments of OPTEMPO load. Nearly half (46.7%) of the time ($SD = 23.0\%$), participants reported that their units were at high OPTEMPO, contrasted with 36.3% of the time ($SD = 17.8\%$) at moderate OPTEMPO and 17.5% of the time ($SD = 17.2\%$) at low OPTEMPO.

For each OPTEMPO level, participants reported the average amount of daily sleep they received. Results showed that reported daily sleep varies with OPTEMPO: ANOVA, $F(2, 122) = 69.3067$, $p < .0001$; median test, $\chi^2_2 = 70.2601$, $p < .0001$—that is, the higher the OPTEMPO, the less sleep participants received (low: $M = 7.80$ hr, $SD = 1.52$ hr, $Mdn = 8.00$ hr; moderate: $M = 6.00$ hr, $SD = 1.33$ hr, $Mdn = 6$ hr; and high: $M = 3.90$ hr, $SD = 1.56$ hr, $Mdn = 4$ hr).

Reported daily sleep was also related to the overall sleep hygiene rating, which may reflect the extent to which participants were able to implement sleep hygiene practices while in the field. This association was significant only at high and moderate OPTEMPO levels: high, $F(1, 42) = 6.1292$, $p = .0174$; and moderate, $F(1, 41) = 6.5587$, $p = .0142$.

Frequency of Naps

Respondents were asked to rate the frequency with which they used naps to augment their major sleep period when they were at high, moderate, or low OPTEMPO. Figure 4 shows the frequency of these answers. Not surprisingly, increased OPTEMPO is associated with less napping (i.e., napping frequency drops off as the time available to do anything, other than operations, becomes more limited). This finding could account, in part, for the reduction in average daily sleep during high OPTEMPO. If one combines the two napping categories,

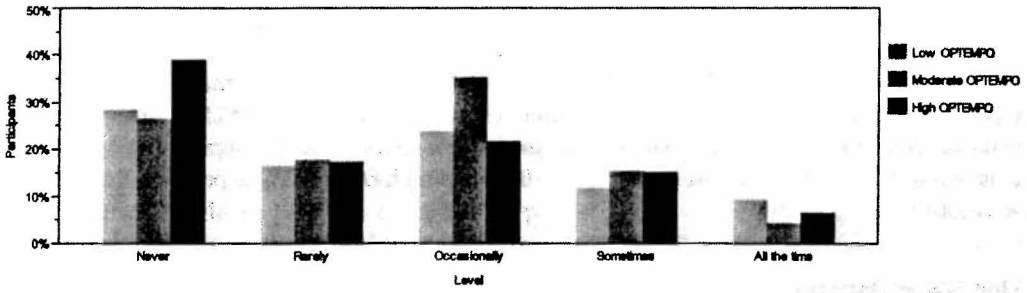

FIGURE 4 Frequency of answers to Survey Item 7 ("In addition to one major sleep period, I took naps to get more sleep") versus operational tempo (OPTEMPO).

"never" and "rarely," 45% of the participants reported that during low and moderate OPTEMPO, they never or rarely napped. During high OPTEMPO, this percentage reached nearly 60%.

Sleep Deprivation

Participants were asked to rate the frequency of sleep deprivation symptoms when they were at high, moderate, or low OPTEMPO. Results showed that increasing OPTEMPO levels lead to greater severity of sleep deprivation symptoms: likelihood ratio test, $\chi^2(1, N = 46) = 44.502$, $p = .0001$. Consequently, 53.5% of the participants reported that they rarely or never felt sleep deprivation symptoms during low OPTEMPO, whereas this percentage decreased to 37.8% during moderate OPTEMPO, and it was only 17.4% during high OPTEMPO. Clearly, an overwhelming number of respondents (82.6%) reported they felt sleep-deprived occasionally, sometimes, or all the time while at high OPTEMPO.

Sleep Deprivation and Stress Levels

Given that the questions so far captured a subjective evaluation of daily sleep, napping, and sleep deprivation, the next group of questions assessed the severity of sleep deprivation, the level of stress experienced during the deployment, and the use of caffeinated drinks.

Participants indicated that sleep deprivation was occasionally regarded as a serious problem in their unit ($M = 2.67$, $SD = 0.96$, $Mdn = 3.00$). During deployments, they were "sometimes" exposed to significant sources of stress ($M = 3.91$, $SD = 1.05$, $Mdn = 4.00$). The more strenuous the deployment (higher OPTEMPO), the more they experienced significant stress (Spearman's $\rho = 0.42$, $p = .003$). Participants who indicated more exposure to stress also indicated that they got more naps during high OPTEMPO (Spearman's $\rho = 0.31$, $p = .038$), possibly because the efficacy of napping becomes more evident during such missions.

Stress level on the most recent deployment was reported as occasionally very high ($M = 3.37$, $SD = 1.06$, $Mdn = 3.00$). In general, the frequency of very high stress levels was related to the frequency of sleep deprivation symptoms during high OPTEMPO missions (Spearman's $\rho = 0.32$, $p = .033$), whereas there is negative relationship between reported daily sleep during such operations (Spearman's $\rho = 0.37$, $p = .014$; i.e., personnel sleeping more felt

less extreme stress). It was not all that surprising that the deployed personnel reported that they "sometimes" consume more caffeinated drinks (coffee, soft drinks, or tea) compared to their normal life ($M = 3.44$, $SD = 1.55$, $Mdn = 4.00$), with the percentage of participants reporting increased consumption "all the time" reaching 40% ($n = 18$). The frequency of caffeine consumption increase was related to the frequency of sleep deprivation symptoms during moderate (Spearman's $\rho = 0.46$, $p = .001$) and high OPTEMPO (Spearman's $\rho = 0.39$, $p = .008$).

Unit Sleep Patterns

To address unit sleep patterns, respondents were asked to report on their own sleep patterns and those of subordinates, peers, and superiors. Overall, participants reported that the sleep they received during deployment was not enough ($Mdn = 2$: "less than needed"). They reported that subordinates' and peers' sleep was "about right" (median response), whereas they reported that sleep for "self" and "superiors" was "less than needed" (median response). Of the four sleep categories (self, subordinates, peers, and superiors), an overwhelming majority of respondents reported that their superiors slept significantly less than needed (Kruskal–Wallis rank sum test), $\chi^2(1, N =) = 6.1655$, $p = .013$). Nearly 70% of respondents reported that their superiors receive less or much less than the amount of sleep they needed. Nearly one half of the respondents (47.0%) reported that subordinates receive less or much less sleep than needed. When looking at their own sleep patterns, over one half (55.1%) of respondents reported receiving less or much less sleep than they need.

Interventions to Address Sleep Issues

An open-ended question asked respondents to report things that positively affected the sleep of their unit. Twelve participants noted the following factors: (a) shift work and rotation of individuals or squads; (b) monitoring personnel performance and motivation by unit leaders; (c) enforcing a work schedule, mandatory sleep periods, or days off; and (d) employing operational risk-management policies when conducting operations.

Negative Factors Affecting Unit Rest

Participants were also asked to report any factors that adversely affected their unit. These comments from 16 respondents are summarized in the following categories: (a) heat stress, (b) working long duty hours or non-optimized rotations, (c) lack of soldiers' refit opportunities, (d) increased workload due to reduced manning, (e) commitments other than conducting operations, (f) high OPTEMPO, (g) difficulty in scheduling activities, and (h) poor management of personnel.

DISCUSSION

This study afforded an opportunity to address sleep deprivation issues during military operations from the viewpoint of Army officers newly returned from combat. The way respondents were

determined poses both a strength and a threat to the validity of our findings. The survey respondents are not a random sample of all Army officers, but represent a "convenience" sample of deployed Army officers taking part in the operations currently conducted in Iraq and Afghanistan. These officers were drawn from the larger population of Army officers who conduct their duties as junior leaders for the deployment period. We attempted to minimize possible bias of the sample by coordinating with the school's leadership to recruit respondents, since course attendants represent a typical group of returning Army officers. One strength of this study is the use of these "real-world" respondents, since they lend external validity to the results.

This study identifies several disturbing findings. The results indicate that a very high percentage (80%) of participants did not receive a briefing on sleep management planning, although such briefings are mandatory under U.S. Army policy. The majority of participants in this survey were junior leaders (i.e., platoon leaders, company commanders, or staff officers at the company or battalion level). If they did not receive briefings on sleep management planning, it is likely they did not give such briefings to the soldiers for whom they were responsible. The findings from this survey indicate that this figure has dropped even lower than that reported by Doheney (2004), pointing to the possibility that commanders address sleep management issues even less now than at the beginning of the Global War on Terror. In many units, even the most basic sleep and fatigue management practices (e.g., encouraging napping or designating dark and quiet places to sleep) were not implemented. Fortunately, the study also revealed that briefing soldiers on (and implementing) sleep plan management had a positive effect on the sleep hygiene of a unit.

Another notable finding in the study relates to the sleep reported for each level of OPTEMPO. Respondents reported spending nearly half their time at high OPTEMPO—as much as 7 months of a 15-month deployment—during which time they averaged approximately 4 hr of sleep per night. Unquestionably, 4 hr of sleep is insufficient for young men and women whose survival is dependent upon their ability to remain vigilant.

The amount of daily sleep reported by respondents to our survey is significantly lower than the recommended requirement of 8 hr of sleep per day. Yet, this result is in keeping with results from other studies conducted in Southwest Asia, which reported sleep issues in U.S. Army and Marine Aviation units (Doheney, 2004; Miller, Shattuck, & Matsangas, 2006). (For a review of fatigue in military operational environments, refer to Miller, Matsangas, & Shattuck, 2008.) OPTEMPO also appeared to be related to napping behavior: When soldiers were getting the least amount of sleep (i.e., during high OPTEMPO), they were also least likely to take naps.

Soldiers who deploy to a Combat Training Center and are at high OPTEMPO for a few weeks may be able to sustain an acceptable level of performance. However, placing soldiers in dangerous environments for up to 15 months and restricting their sleep will inevitably take its toll. The effects of acute and chronic sleep deprivation, coupled with other stressors of combat, could quite possibly impact soldiers long after they have returned home. Recovery from trauma and stress, whether physical or psychological, requires a sufficient amount of quality sleep (Dolan, Adler, Thomas, & Castro, 2005). Chronic sleep restriction may exacerbate underlying health issues and prevent the body from healing and fending off stress-related illnesses (Naitoh, Kelly, & Englund, 1990).

Responses evaluating self, peers', subordinates', and superiors' sleep suggest worrisome trends as well. Respondents acknowledged that the amount of sleep received by the participants

and others with whom they served was inadequate. In fact, they reported that those in more senior leadership positions (and, therefore, those who had more responsibility) were 20% more likely to get inadequate sleep. This finding is consistent with earlier studies (Belenky, 1997). The very people who are making decisions that will affect the greatest number of soldiers are getting the least amount of sleep, and are likely to be the most impaired as a result of their sleep deprivation.

There are two final concerns raised by the survey results. First is the continuous push "to do more with less." Survey responses regarding management of work and rest schedules while deployed suggest that units are undermanned with respect to the missions they are given. Units compensate for lack of personnel in various ways. For example, the number of patrols a soldier must perform may increase, the number of soldiers sent out on a patrol may be decreased, or the length of a soldier's shift may increase. Any of these compensatory strategies could have negative consequences. Second is the inference that soldiers are not being managed properly. This may suggest a lack of good leadership or, perhaps, an inadequate understanding of Army doctrine with respect to sustained operations. Although there is Army doctrine that addresses issues such as sleep hygiene, it is either not adequate or not widely known.

We conclude this article with an excerpt from Shay (1998):

> Pretending to be superhuman is very dangerous. In a well-led military, the self-maintenance of the commander, the interests of his or her country, and the good of the troops are incommensurable only when the enemy succeeds in making them so. It is time to critically reexamine our love affair with stoic self-denial, starting with the service academies. If an adversary can turn our commanders into sleepwalking zombies, from a moral point of view the adversary has done nothing fundamentally different than destroying supplies of food, water, or ammunition. Such could be the outcome, despite our best efforts to counter it. But we must stop doing it to ourselves and handing the enemy a dangerous and unearned advantage. (p. 104)

To Shay (1998), we add this: Although military leaders often must rely on other units to resupply them with food, water, or ammunition, well-rested soldiers are a resource almost entirely under the leaders' control. As leaders put a great deal of effort into managing the logistical resources of combat, they must also expend time and effort into managing the alertness of their soldiers. Failure to attend to either logistical or human resources can lead to the same dire consequences.

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