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Engaging Stakeholders to Optimize Sleep Disorders' Management in the U.S. Military: A Qualitative Analysis

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ABSTRACT

Introduction:

Sleep disorders' are highly prevalent among U.S. active duty service members (ADSMs) and present well-documented challenges to military health, safety, and performance. In addition to increased need for sleep medicine services, a major barrier to effective sleep management has been a lack of alignment among patients, health providers, and economic-decision-makers. To address this gap in knowledge, the purpose of the present study was to engage diverse stakeholders vested in improving sleep disorders' management in the military.

Materials and Methods:

We elicited feedback from ADSMs with sleep disorders (five focus group discussion, $n = 26$) and primary care managers (PCMs) (11 individual semi-structured interview) in two military treatment facilities (MTFs) in the National Capitol Region, in addition to national level military and civilian administrative stakeholders (11 individual semi-structured interview) about their experiences with sleep disorders' management in U.S. MTFs, including facilitators and barriers for reaching a definitive sleep diagnosis, convenience and effectiveness of sleep treatments, and key desired outcomes from interventions designed to address effectively sleep disorders in the U.S. military health care system (MHS). Recordings from focus groups and semi-structured interviews were transcribed verbatim and analyzed using QSR International's NVivo 12 software using inductive thematic analysis. The study was approved by Walter Reed National Military Medical Center Department of Research Programs.

Results:

Active duty service members with sleep disorders often fail to recognize their need for professional sleep management. Whereas PCMs identified themselves as first-line providers for sleep disorders in the military, patients lacked confidence that PCMs can make accurate diagnoses and deliver effective sleep treatments. Active duty service members cited needs for expeditious treatment, educational support and care coordination, and support for obtaining sleep treatments during deployment. Challenges that PCMs identified for effective management include insufficient time during routine care visits, delays in scheduling testing procedures, and limited number of sleep specialists. Primary care managers suggested offering evidence-based telehealth tools and enhanced care coordination between PCMs and specialists; standardized medical education, materials, and tools; patient preparation before appointments; self-administered patient education; and including behavioral sleep specialists as part of the sleep management team. For administrative stakeholders, key outcomes of enhanced sleep management included (1) improved resource allocation and cost savings, and (2) improved ADSM safety, productivity, and combat effectiveness.

Conclusion:

Current military sleep management practices are neither satisfactory nor maximally effective. Our findings suggest that solving the military sleep problem will require sustained effort and ongoing collaboration from ADSM patients, providers, and health systems leaders. Important potential roles for telehealth and technology were identified. Future research should seek to enhance implementation of sleep management best practices to improve outcomes for patients, providers, MHS, and the military as a whole.

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INTRODUCTION

The U.S. Army Performance Triad (P3) pinpoints sleep, physical activity, and nutrition as the key components for optimal physical, cognitive, and emotional well-being of active duty service members (ADSMs).[1] Nevertheless, insufficient and disturbed sleep is highly prevalent among ADSMs, especially during deployment.[2,3] Long work hours, non-traditional work schedules, and a relentless pace all contribute to inadequate sleep opportunity.[4] In the deployed environment, ADSMs express concern that inadequate sleep is linked to increased accidents and risk.[5] In addition, clinical sleep disorders such as insomnia, obstructive sleep apnea (OSA), shift work disorder, and others are also very common among ADSMs. Well-documented relations exist between insufficient and disturbed sleep and adverse outcomes including worsened mental and physical health, diminished quality of life, impaired workplace productivity and operational readiness, and increased economic costs.[6] Despite the elevated prevalence and substantial consequences of sleep problems in the military, efforts to improve sleep management among ADSMs have achieved limited success. Barriers have included an insufficient number of sleep specialists, lack of standardized approaches to sleep management, and cumbersome treatment formats. In addition, efforts to improve sleep management have been stymied by ineffective implementation at the military treatment facility (MTF) and military health system (MHS) levels. Major barriers to effective implementation have been a lack of stakeholder engagement and an incomplete understanding of the unique occupational demands on ADSMs, resulting in a lack of commitment from all parties to achieve desired results. Because enhancing sleep management will impact patients, health providers, and health systems administrators, it is necessary to understand the objectives for sleep management as well as perceived barriers and facilitators to optimal sleep management from each of these constituent groups. Yet surprisingly, little is known about how patients, health providers, and health system leaders perceive sleep management or would seek to enhance it despite acknowledgment from a consensus panel of the U.S. DoD and Veteran's Affairs (VA) leaders that this is a critical research gap.[7] To address this literature gap and to support future implementation of enhanced sleep management practices, this study engaged and elicited insights from ADSMs, primary care managers (PCMs), and key administrative stakeholders regarding real-world facilitators and barriers to effective sleep management in the MHS. As part of a larger, mixed-method program of research, qualitative methods were employed to gain insight into (1) burden of sleep disorders within U.S. MTFs, (2) key outcomes of enhanced sleep management in the U.S. MHS, (3) ADSMs' and PCMs' perceived barriers to reaching definitive sleep diagnoses, and (4) convenience and effectiveness of current sleep treatment approaches.

METHODS

Study Design

Qualitative methods using grounded theory approach were employed to solicit feedback from ADSMs (focus groups, FGs), PCMs (semi-structured interviews), and administrative stakeholders (semi-structured interviews) about sleep disorders' management at U.S. MTFs. We followed the Consolidated criteria for Reporting Qualitative research checklist for interviews and focus groups (Supplementary Table S1).[8] The study protocol was deemed exempt by Walter Reed National Military Medical Center (WRNMMC) IRB (WRNMMC-2019-0253, 917038) and by the Fort Belvoir Community Hospital (FBCH) Department of Research Programs.

Participants

Active duty service members were recruited via provider referral and fliers placed within the Internal Medicine, Family Medicine, and Sleep Medicine clinics at WRNMMC and FBCH. Eligibility criteria for ADSMs included active duty status, age $\geq$18 years, and diagnosis or suspicion of any sleep disorder. Primary care managers and administrative stakeholders were recruited via phone calls and emails. Eligibility criteria for PCMs included provision of primary care services for sleep disorders to ADSMs (e.g., screening, triage, follow-up, etc.). Eligibility criteria for administrative stakeholders included economic decision-making or influencing access to health care services at military and civilian health systems.

Conduct of Focus Groups with ADSMs

Focus groups were held off-base in private restaurant rooms and lasted for 45-60 minutes. Focus groups were led by two members of the research team (M.A. and H.E.) using an FG guide (FG questions are available in Supplementary Table S2). All participants provided verbal consent. Focus groups were audio recorded. To ensure anonymity, participants were instructed to use an alias. To ensure confidentiality, participants were instructed not to discuss the FGs or

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share information with non-participants. Participants received a light meal and $50 gift card as compensation. Evidence from literature shows that 80% of prevalent themes are discoverable within two to three focus groups and 90% are discoverable within three to six focus groups.[9] We anticipated to reach saturation after the third focus group.

Conduct of Semi-Structured Interviews with Providers and Administrative Stakeholders

Semi-structured interviews were conducted one on one by M.A. and H.E., in-person (PCMs) or via secure remote means (e.g., WebEx) or telephone (administrative stakeholders), based on participant preference. Interviews lasted 30-45 minutes and were recorded. Participants were thanked for participation. Interview questions are available in Supplementary Table S2.

Data Analysis

Audio recordings from FGs and semi-structured interviews were transcribed verbatim and reviewed for accuracy and completeness. After redaction, transcripts were entered into QSR International's NVivo 12 software for analysis. We evaluated thematic saturation throughout a concurrent process of data collection and analysis via assessing whether new focus groups or interviews repeated the topics and themes in the previous groups or interviews of the same group of participants. Two trained qualitative researchers (M.A. and H.E.) utilized inductive thematic analysis to systematically identify, organize, and add insight to the patterns of meaning (i.e., themes). Six phases of analysis included (1) familiarization, (2) generating codes, final codes were reached via consensus between the two facilitators, (3) extracting themes, (4) reviewing themes, (5) defining final themes and supporting quotes, and (6) producing the report.[10]

RESULTS

Twenty-six diverse ADSMs participated in five FGs (three WRNMMC and two FBCH; see Table I). Eleven PCMs (six WRNMMC and five FBCH) and 11 administrative stakeholders (nine military and two civilian) participated in semi-structured interviews. No new codes were identified after the fourth focus group. Supplementary Table S3 summarizes topics discussed, themes identified, and illustrative quotations from each stakeholder group.

TABLE I. Focus Group Participant Demographic Characteristic

Demographic characteristics	Number of participants	Percentage of participants (%)
Gender		
Female	11	42
Male	15	58
Race[a]		
African American	4	15
Hispanic/Latino/Spanish background	6	22
Caucasian	17	63
Education		
Some college education	9	35
College degree	7	27
Graduate degree—masters	9	35
Graduate degree—doctorate	1	4
Age group		
18-24	3	12
15-34	5	20
35-44	9	35
45-54	6	23
55-64	2	8
65 or above	1	4
Military rank (enlisted paygrade)		
E3	2	8
E4	2	8
E5	1	4
E6	6	23
E7	3	12
E8	3	12
O4	4	15
0-5	2	8
O-8	1	4
Unreported	2	8

[a]One participant identified himself as both Hispanic and Caucasian.

ADSM (Patient) Perceptions

Reaching definite diagnosis

Active duty service members are slow to realize that they have a sleep problem, which delays seeking care (Theme 1). Patients' first challenge is uncertainty whether their sleep is normal or abnormal.

Insufficient sleep is common and accepted as normal in the military (Theme 2). A major barrier to enhanced sleep management is the acceptance of insufficient sleep as normal within the military culture, which begins during basic training. Some ADSMs spoke about the stigma associated with seeking medical services for sleep complaints.

PCMs might lack expertise to diagnose and treat sleep disorders (Theme 3). Active duty service members are uncertain whether PCMs are competent to diagnose and treat sleep disorders. Active duty service members perceive that care from PCMs might delay referral for appropriate diagnostic consultation, in part because of not perceiving sleep problems as severe enough to warrant specialty referral or evaluation.

Sleep specialist consultation can be necessary for reaching a definitive diagnosis; however, several barriers impede scheduling the initial sleep appointment (Theme 4). Active duty service members perceive sleep specialists as the providers most qualified to manage sleep disorders. However, barriers to specialist referral and delays in scheduling appointments frustrate patients and delay care. Identified barriers included shortage of sleep specialists and sleep centers in the MHS.

Sleep treatment experience

Sleep specialists are credible and trustworthy care managers (Theme 5). Active duty service members reiterated their

perceptions that sleep specialists are the providers who can accurately treat sleep disorders. Trust in providers is further enhanced through continuous communication and patient education.

Patients desire outcomes that reflect clinical effectiveness; ADSMs perceive that PCMs focus more on treatment adherence than on treatment success (Theme 6). Several participants criticized that provider follow-up is focused on "obedience" and "enforcement" of the treatment plan, rather than treatment effectiveness. Some spoke about challenges with treatment adherence, particularly during remote deployment.

Successful sleep management requires personalization and takes time (Theme 7). Personalized sleep treatment is fundamental for patient success. Active duty service members believe that focusing on their specific symptoms allows targeted, effective treatment. Some participants expressed frustration with generic treatments that lead to limited improvement. Nonetheless, ADSMs acknowledge that achieving positive, lasting results takes time.

Continuous positive airway pressure is an effective treatment approach, but it requires educational support (Theme 8). Active duty service members diagnosed with OSA discussed specific barriers impeding success with continuous positive airway pressure (CPAP). Several ADSMs mentioned that they received little education on how to use their machines, leading to incorrect use or discontinuation.

ADSMs experience major challenges obtaining sleep equipment, supplies, and medication refills, especially during deployment (Theme 9). Many participants discussed logistic challenges they had experienced when filling their medications or receiving their sleep equipment (e.g., CPAP), during deployment.

PCM Perceptions

Sleep disorders' burden

Sleep complaints and clinical sleep disorders are very common in military health care facilities (Theme 1). All PCMs reported that insufficient and disturbed sleep are a common patient complaint encountered on a daily basis.

Insomnia and OSA are the most common sleep disorders among ADSMs (Theme 2). All PCMs reported that insomnia and OSA are the most common disorders seen in their practice. Primary care managers also mentioned other sleep disorders, such as sleep disturbances associated with PTSD.

Role of PCMs in sleep management

PCMs are first responders to sleep complaints; they manage almost all disorders within their patient populations (Theme 3). Primary care managers are involved in sleep management with all sleep disorder cases given their roles as gatekeepers in the MHS. Once patients share their sleep concerns, PCMs either manage these complaints or refer for sleep specialist consultation.

Reaching definite sleep diagnosis

Lack of objective assessment and lack of close follow-up hinder reaching definitive sleep diagnoses (Theme 4). Most PCMs shared their dissatisfaction with the limited number of assessment tools currently available to them, as well as lack of sleep follow-up. With the notable exceptions of polysomnography and home sleep apnea testing, the lack of objective measurement of sleep and poor follow-up sleep data present barriers to reaching definitive diagnoses. Primary care managers noted that the potential for secondary gain (i.e., seeking sleep-related diagnoses for disability purposes) is exacerbated by the lack of objective measurement and lack of evidence needed to confirm diagnoses.

Clinical encounters with the PCMs are very time-limited, and sleep is often discussed only at the end of an appointment (Theme 5). Although sleep complaints are common in primary care, PCMs and patients tend to mention sleep only after discussing their chief complaint.

Sleep treatment experience

Before the coronavirus pandemic, options for patient–provider communication were limited to primarily face-to-face care, resulting in suboptimal continuity of care (Theme 6). Primary care managers shared their discomfort about the lack of availability of virtual communications to support continuity of care.

Scheduling follow-up appointments is challenging (Theme 7). Both PCMs and ADSMs have busy work schedules, which for different reasons present barriers when scheduling follow-up appointments. Some deployed ADSMs are unable to schedule ahead for months at a time, because of their continuously evolving job demands and work schedules.

Referring patients for sleep consultation or testing involves a lengthy process that is disconnected from primary care (Theme 8). Primary care managers acknowledged that the long delays between their referring and an ADSM eventually seeing a sleep specialist often takes several months. Even if patients are seen in the sleep center, discontinuity of care is a major problem revealed by PCMs during the interviews. Primary care managers are generally unable to follow their patients after the initial referral to the brick-and-mortar sleep center.

Sleep study and sleep treatment devices are challenging for patients (Theme 9). Primary care managers spoke about logistical challenges of having sleep studies, which result in inconvenience to some patients. Along the same lines, PCMs highlighted challenges encountered by patients in terms of using CPAP and other sleep devices, which require education and ongoing support to ensure consistent, effective use.

PCMs value and recognize the importance of sleep psychology and behavioral sleep treatments (Theme 10). Although PCMs acknowledged the importance and effectiveness of behavioral sleep treatments, they stated that they do not have time to deliver such interventions themselves. Primary care managers noted that behavioral sleep treatments require ongoing follow-up and personal support, since patients often do not follow through with similar recommendations without independent support and encouragement.

Lack of standardized behavioral sleep treatment materials is a barrier to implementation and widespread adoption (Theme 11). Primary care managers are not sleep experts, and they encounter an overwhelming number of behavioral sleep treatment options from both validated and unproven sources.

PCMs are not satisfied with the clinical effectiveness of currently available sleep treatments (Theme 12). Some PCMs were skeptical about acknowledging the effectiveness of current approaches to insomnia management. Primary care managers revealed areas for improvement including reducing wait times, increasing ease and accuracy of clinical diagnoses, and adapting treatment plans to accommodate ADSMs' work schedules.

Suggestions to improve sleep management

Primary care managers shared several suggestions to enhance sleep management at MTFs. Suggestions and illustrative quotations are presented in Table II.

Administrative Stakeholder Perceptions

Sleep disorders' burden

Sleep disorders' place a substantial burden on ADSMs, military operations, and the MHS (Theme 1). Administrative stakeholders perceived insufficient sleep to be a pervasive issue among the active duty population. Cultural norms within the military result in the normalization of insufficient sleep. Administrative stakeholders also recognized that insufficient sleep is related to other adverse health conditions, performance errors, and health care system inefficiencies.

Demand for sleep disorder treatments has increased in recent decades exceeding the available supply of sleep care within the MHS (Theme 2). Administrative stakeholders discussed the lack of sleep specialty care available at many MTFs, as well perceptions regarding prioritizing and triaging patients with sleep concerns. As a result of these barriers, ADSMs experience delays in diagnosis and treatment. In addition, administrative stakeholders were concerned that lack of capacity within the MHS results in increased leakage to the civilian networks, increasing costs to the system and taxpayers and reducing standardization and quality of care.

Key outcomes of effectively addressing sleep disorders

Administrative stakeholders desire improvements in ADSMs health outcomes and military performance (Theme 3). Participants enumerated several benefits of addressing current gaps in sleep management within the MHS. Improved sleep management will have a direct positive impact on ADSMs' sleep and health outcomes, as well as to their military performance. Many interviewees articulated that if the military force were better rested, ADSMs would demonstrate greater productivity, improved combat effectiveness and safety, and increased esprit de corps.

Administrative stakeholders strive for improved MHS efficiency and effectiveness (Theme 4). Administrators expressed confidence that the MHS would see long-term cost savings as well as more efficient resource utilization as a result of improved sleep management. Reduced leakage to the civilian network would be an important result of this improved system efficiency.

DISCUSSION

This qualitative engagement study represents the first systematic analysis to date of diverse perspectives of key stakeholders regarding sleep management in the U.S. Military. Active duty service members, health providers, and administrative stakeholders indicated that insufficient and disturbed sleep adversely impact military operational readiness, diminish mental and physical health, and severely strain the busy MHS. Speaking from their own experiences, participants in FGs and semi-structured interviews identified specific barriers and potential facilitators of enhanced sleep management in the military. In addition to important details reported by constituent groups, the most important finding of this study is that enhanced sleep management in the military will require sustained collaboration by diverse stakeholders with at-times competing interests. Active duty service member patients identified cultural, provider-based, and treatment-specific barriers and facilitators to enhanced sleep management. First, patients often fail to recognize that their sleep problem warrants professional intervention. Patients noted that insufficient sleep is normalized as early as basic training, when 5 or fewer hours of sleep (well below recommended sleep duration for optimal performance and health) is common.[11] This finding mirrors prior reports that have attributed lack of sleep knowledge among SMs to limited sleep education and lack of a standardized sleep resources in the military.[12] Similarly, a previous expert panel that included military health providers, line leaders, and researchers reported that the importance of sleep in the military was consistently undermined by competing pressures and military cultural norms. Others have also found that military cultural norms cause discomfort in seeking professional help and using prescription sleep medications.[13] Present results are consistent with and expand upon these findings by highlighting the role of social stigma on seeking medical help for sleep complaints.[12] In addition to culture and stigma, patients also reported feeling less confident in PCMs than in specialists in terms of accurate diagnosis and effective treatment, in part because of communication barriers. Finally, patients described treatment-specific needs, including the need for a more expeditious treatment

TABLE II. PCMs Suggestions to Improve Sleep Management in the US MHS

Suggestion	Illustrative quotations
1. Identify and train sleep Champions to drive improved sleep management at MTFs.	*I know there's always a debate between generalizing and specializing, but maybe some sleep champions. Some primary care providers in each area with a little more familiarity than their colleagues, maybe. And then again support staff with more familiarity with it.*
2. Enhance sleep medical education and training for PCMs.	*I think education of the providers would be helpful, to emphasize or discuss from our standpoint what we see and what the struggles are. On a larger note though, we have a lot of providers in this clinic and everyone has different approaches, so it'd be interesting to get everyone together.*
3. Standardized sleep management materials and tools will enable PCMs to increase sleep care.	• *The most helpful is probably just being able to go through a set number of questions to get a better idea of the patient's symptoms. Like if they come in with anxiety or behavior issues, being able to incorporate sleep into that kind of questionnaire.* • *I think developing less subjective screening tools would be the biggest thing, so as a provider I can know if a person is truly at risk for a sleep disorder. Then I can decrease the demand for sleep specialists so those who really do need to see them are getting in in a reasonable time.* *The first (suggestion) would be use of questionnaires. Right now, I don't keep it at my fingertips. I'm familiar with an Epworth questionnaire, I hear the residents use the Stop Bang assessment tool, and I probably need to have those in my drawer or electronically. It'd be great if it was in the EHR—you could pull it and get into your note with their answers. If it was something you knew they were coming in with ahead of time, then your staff could give them the questionnaire to do. And then how do you get it into the electronic chart, once you have it filled out?*
4. Improve access to sleep specialists by increasing appointment slots and reducing waiting times	• *Access to the sleep doctors or providers. If there were greater access to all of that, that would help.* • *I do think just being able to see specialty providers faster would be good.*
5. Leverage technology to enable virtual follow-up and support continuity of care	*Any kind of virtual tool that improves communication and provides a way to assess compliance virtually, that can be managed by a non-physician, like a nurse or technician, would be helpful.*
6. Empowering patients to prepare before appointments will help improve efficiency and diagnostic accuracy.	*There's often not enough time in a single appointment to do it. And if the patient was not prepared—if you knew ahead of time that's what they were coming in for, they could keep and bring in a diary, so you have some data to work with. But if it's the first visit, then you have to ask them to do those things and then they have to come back for a second visit.*
7. Self-guided patient education and tools will help overcome the short appointment barrier.	*So, I think having something more durable like a standardized form or a commercially available patient instruction that can be emailed or printed and delivered, would be helpful. Standard sleep hygiene, or a standard for beginning to use CPAP or other things—again, having the tools and then being able to somehow share them quickly.*
8. Incorporate behavioral sleep approaches into the sleep management armamentarium.	*It would be really nice to have a behavioral health person who is readily available and specializes in CBT for insomnia or if there were sleep classes or something like that. I know we have that for pain but CBT groups for people with insomnia so they can talk to each other and work on it would be good.*

journey, need for greater educational support and care coordination to help with sleep treatments, and challenges in obtaining sleep treatments and equipment during deployment. Primary care managers perceive themselves as first-line providers for sleep disorders in the military, including insomnia and OSA, the most common disorders seen in clinical practice.[14–16]

Like patients, providers enumerated barriers and potential facilitators to effective sleep management in the MHS. Consistent with prior reports, identified logistical barriers included insufficient time to evaluate and treat sleep complaints during routine care visits, difficulties scheduling in-lab testing procedures, and other delays because of a limited number of sleep specialists. When asked for potential solutions, providers suggested evidence-based telehealth tools to enhance remote management of sleep disorders. Providers noted that such telehealth tools, along with enhanced care coordination between specialists and PCMs, would improve both diagnostic accuracy and outcomes tracking through enhanced follow-up among ADSMs with sleep disorders. Providers enumerated additional potential advantages of such telehealth tools including objective assessment as well as standardization of sleep screening, triage, education, and behavioral sleep treatments. Additional suggestions offered by PCMs included providing standardized medical education, materials, and tools; increasing care coordination and access to sleep specialists; using telehealth tools to support continuity of care and follow-up; developing objective sleep assessments; supporting patient preparation before appointments, including self-directed patient education; and

including behavioral sleep specialists as part of the sleep management team. These suggestions confirm and expand upon previous recommendations regarding sleep management in the MHS.[12]

Like patients and providers, administrative stakeholders recognized both the importance of sleep and current barriers to effective sleep management in the MHS. From an administrative perspective, the most important barrier has been an exploding demand for sleep specialty care, which has rapidly exceeded available supply within the busy MHS. As a result, many patients including ADSMs are cared for by the Tricare Managed Care Support Contractor (i.e., civilian networks) and receive inconsistent quality of care. Administrative stakeholders also identified (1) improved resource allocation and cost savings, and (2) improved ADSM combat effectiveness, productivity, and safety, as key outcomes of enhanced sleep management. This multi-stakeholder engagement study represents the first effort to engage key constituents to inform enhanced sleep management in the MHS. Our study employed rigorous qualitative methods to elicit insights into a broad range of topics pertinent to sleep management from the perspective of the patient, provider, and health system. At the same time, although theme saturation was achieved (suggesting a sufficient sample size), participants were recruited from only two MTFs in one region. It is thus unknown how well our results will generalize to ADSMs and MTFs outside the National Capitol Region. In conclusion, ADSMs, PCMs, and administrative stakeholders all recognized that current military sleep management practices are neither satisfactory nor maximally effective. Our findings suggest that solving the military sleep problem will require sustained effort and ongoing collaboration from diverse stakeholders including patients, health providers, and health systems leaders. Important potential roles for telehealth and technology were identified. Future research should leverage these findings in order to enhance implementation of sleep management best practices. This will improve outcomes for patients, providers, MTFs, and the military as a whole. Such research is currently underway in the National Capitol Region and elsewhere.

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SUPPLEMENTARY MATERIAL

Supplementary material is available at *Military Medicine* online.

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CONFLICT OF INTEREST STATEMENT

CDM serves as a consultant to AstraZeneca, Bayer Pharmaceuticals, Incyte, Merck, Pfizer, Sanofi, and Takeda. CLD has served as a scientific consultant and/or received grant support from Eisai, Jazz, Suven, Aldaddin Dreamer, Axsome, Harmony Biosciences, Bleep Sleep, and is a speaker for Eisai and Harmony Biosciences. MAG has received grants from Jazz Pharmaceuticals, Kemin Foods, and CeraZ. He has served as a consultant for Merck, Idorsia, Fitbit, Natrol, Athleta, Casper, NightFood, Simple Habit, Unilever, and LYMA. EMW and JSA's institution has received research support from the AASM Foundation, U.S. Department of Defense, Merck, and ResMed. EMW has served as a scientific consultant for DayZz, Eisai, Merck, and Purdue, and is an equity shareholder in WellTap.

REFERENCES

1. Lentino C, Purvis D, Murphy K, Deuster P: Sleep as a component of the performance triad: the importance of sleep in a military population. US Army Med Dep J 2013; 98–108.
2. Seelig AD, Jacobson IG, Smith B, et al: Sleep patterns before, during, and after deployment to Iraq and Afghanistan. Sleep 2010; 33(12): 1615–22.
3. Miller NL, Shattuck LG, Matsangas P: Sleep and fatigue issues in continuous operations: a survey of U.S. Army officers. Behav Sleep Med 2011; 9(1): 53–65.
4. Williams SG, Collen J, Wickwire E, Lettieri CJ, Mysliwiec V: The impact of sleep on soldier performance. Curr Psychiatry Rep 2014; 16(8): 1–13.
5. LoPresti ML, Anderson JA, Saboe KN, McGurk DL, Balkin TJ, Sipos ML: The impact of insufficient sleep on combat mission performance. Mil Behav Heal 2016; 4(4): 356–63.
6. Capaldi VF, Balkin TJ, Mysliwiec V: Optimizing sleep in the military: challenges and opportunities. Chest 2019; 155(1): 215–26.
7. Chowdhuri S, Ulmer C, Balish M, et al: *VA/DoD Clinical Practice Guidelines for the Management of Chronic Insomnia Disorder and Obstructive Sleep Apnea*. 2019. https://www.healthquality.va.gov/guidelines/CD/insomnia/index.asp.
8. Tong A, Sainsbury P, Craig J: Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. Int J Qual Heal Care 2007; 19(6): 349–57.
9. Guest G, Namey E, McKenna K: How many focus groups are enough? Building an evidence base for nonprobability sample sizes. Field Methods 2017; 29(1): 3–22.
10. Braun V, Clarke V: Using thematic analysis in psychology. Qual Res Psychol 2006; 3(2): 77–101.
11. Crowley SK, Wilkinson LL, Burroughs EL, et al: Sleep during basic combat training: A qualitative study. Mil Med 2012; 177(7): 823–8.
12. Troxel WM, Shih RA, Pedersen E, et al: *Sleep in the Military: Promoting Healthy Sleep among U.S. Servicemembers*. RAND Corporation; 2015.
13. Lincoln ML, Moore RS, Ames GM: Sleep disturbances after deployment: National Guard soldiers' experiences and strategies. Sleep Heal 2018; 4(4): 377–83.
14. Capaldi VF, Guerrero ML, Killgore WDS: Sleep disruptions among returning combat veterans from Iraq and Afghanistan. Mil Med 2011; 176(8): 879–88.
15. Mysliwiec V, Gill J, Lee H, et al: Sleep disorders in US military personnel: A high rate of comorbid insomnia and obstructive sleep apnea. Chest 2013; 144(2): 549–57.
16. Wickwire EM, Collop NA: Insomnia and sleep-related breathing disorders. Chest 2010; 137(6): 1449–63.