

# Survey of Resources in Behavioral Sleep Medicine Across the Department of Defense, Defense Health Agency

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## ABSTRACT

### Introduction:

Insomnia affects approximately 40% of active duty service members and adversely affects health, readiness, and safety. The VA/DoD Clinical Practice Guideline for the management of insomnia recommends cognitive-behavioral treatment of insomnia (CBTI) or its abbreviated version (brief behavioral treatment of insomnia [BBTI]) as the first-line insomnia treatment. The goal of this study was to assess CBTI/BBTI resources at MTFs, perceived facilitators and barriers for CBTI/BBTI, and gaps in these treatments across the Defense Health Agency.

### Materials and Methods:

Between July and October 2022, we conducted an electronic survey of CBTI/BBTI resources across Contiguous United States and the District of Columbia (CONUS) and Outside Continental United States (OCONUS) MTFs. The survey was distributed to 154 military sleep health care providers from 32 MTFs, and a link to the survey was posted on two online military sleep medicine discussion forums. Fifteen providers from 12 MTFs volunteered to complete a 30-minute qualitative interview to explore their perception of barriers and facilitators of CBTI/BBTI at their facility.

### Results:

Fifty-two of 154 providers (33.8%) at 20 MTFs completed the survey. A majority of providers indicated that hypnotics remain the most common treatment for insomnia at their facility. Sixty-eight percent reported that CBTI/BBTI was available at their facility and estimated that less than 50% of the patients diagnosed with insomnia receive CBTI/BBTI. The main facilitators were dedicated, trained CBTI/BBTI providers and leadership support. Referrals to the off-post civilian network and self-help apps were not perceived as significant facilitators for augmenting insomnia care capabilities. The primary barriers to offering CBTI/BBTI were under-resourced clinics to meet the high volume of patients presenting with insomnia and scheduling and workflow limitations that impede repeated treatment appointments over the period prescribed by CBTI/BBTI protocols. Four primary themes emerged from qualitative interviews: (1) CBTI/BBTI groups can scale access to insomnia care, but patient engagement and clinical outcomes are perceived as inferior to individual treatment; (2) embedding trained providers in primary or behavioral health care could accelerate access, before escalation and referral to a sleep clinic; (3) few providers have the time to adhere to traditional CBTI protocols, and appointment scheduling often does not support weekly or bi-weekly treatment visits; and (4) the absence of quality and/or continuity of care measures dampens providers' enthusiasm for using external referral resources or self-help apps.

### Conclusions:

Although there is a wide recognition that CBTI/BBTI is the first-line recommended insomnia treatment, the limited scalability of treatment protocols, clinical workflow limitations, and scarcity of trained CBTI/BBTI providers limit the implementation of the VA/DoD clinical guideline. Educating and engaging health care providers and leadership about CBTI, augmenting CBTI-dedicated resources, and adapting clinical workflows were identified as specific strategies needed to meet the current insomnia care needs of service members. Developing protocols for scaling the availability of CBTI expertise at diverse points of care, upstream from the sleep clinics, could accelerate access to care. Establishing standardized quality measures and processes across points of care, including for external providers and self-help apps, would enhance providers' confidence in the quality of insomnia care offered to service members.

## INTRODUCTION

Chronic insomnia is pervasive among service members and adversely affects health and readiness.<sup>1</sup> Chronic insomnia is defined as difficulty falling or staying asleep that persists for

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at least 3 months and is associated with daytime impairments (e.g., memory and concentration difficulties, irritability, somatic symptoms, worry, and absenteeism). Insomnia is the most common sleep disorder in military personnel<sup>2</sup> and has markedly increased in the last two decades throughout the DoD. A 19-fold increase in the diagnosis of insomnia was reported between 2000 and 2009 among service members (an incidence rate of 135.8 in 2009 compared to an incidence rate of 7.2 in 2000 per 10,000 person-years),<sup>3,4</sup> and insomnia increased by a factor of 650% between 1997 and 2011.<sup>4</sup> More recently, an incidence rate of 116.1 cases per 10,000 person-years was reported.<sup>5</sup> Insomnia often occurs comorbidly with psychiatric<sup>6</sup> conditions, including anxiety, depression, PTSD, traumatic brain injury, suicidality, and alcohol use disorder, as well as hypertension and diabetes,<sup>7</sup> and compromises performance, readiness, health, and safety.<sup>8</sup> Insomnia rarely remits spontaneously,<sup>9</sup> and sleep-focused treatments are required to reduce or eliminate insomnia. Hypnotics are a commonly used insomnia treatment among active duty service members.<sup>10</sup> However, their abuse potential, side effects, and link to increased risk of injurious behaviors raise concerns for service members whose occupation is defined by a high operational tempo and/or high-risk duties.<sup>11</sup>

Cognitive-behavioral treatment of insomnia (CBTI) is the first-line insomnia treatment. The VA/DoD, the American College of Physicians, and the American Academy of Sleep Medicine have all concluded that CBTI is the treatment of choice for chronic insomnia.<sup>12–14</sup> CBTI is typically delivered in-person (face-to-face or virtually) over four to eight sessions by a licensed psychologist or a master's-level clinician trained in behavioral sleep medicine. CBTI is highly effective and yields high rates of treatment response and remission, including for chronic insomnia that is comorbid with other conditions.<sup>15–17</sup> An alternative to CBTI is brief behavioral treatment of insomnia (BBTI). BBTI is an effective insomnia treatment,<sup>18</sup> but CBTI remains more effective for patients with insomnia.<sup>19</sup> Despite its effectiveness, CBTI/BBTI remains underutilized and often unavailable in care settings where service members receive sleep health care. Although most clinicians and patients prefer non-pharmacological insomnia treatments, less than 20% are offered behavioral insomnia treatments.<sup>20–22</sup>

To increase the accessibility of evidence-based insomnia treatment, several Internet-based programs (e.g., Path to Better Sleep) and self-help “apps” (e.g., Insomnia Coach and CBTI Coach<sup>23</sup>) have been put forth, and some have demonstrated clinical effectiveness in civilian samples,<sup>24–26</sup> despite challenges with patients' engagement and retention. The extent to which these digital solutions are effective in service members and veterans presenting with chronic insomnia remains to be determined. Nevertheless, web-based programs and self-help apps have shown greater benefits than sleep education or sleep monitoring only.<sup>24</sup>

Currently, there is limited information regarding the availability and utilization of CBTI/BBTI in MTFs. Thus, the goal

of this effort was to conduct a comprehensive assessment of available resources and needs in behavioral sleep medicine across Defense Health Agency (DHA) facilities. Understanding current services and practices, facilitators, and barriers to CBTI/BBTI is critical to meet service members' insomnia care needs and ensures that health care providers are appropriately resourced.

## METHODS

### *Digital Survey and Semi-Structured Qualitative Interviews*

The study received an exempt determination by Advarra, Inc., an independent institutional review board, on July 14, 2022. Data collection occurred between July and October 2022.

A confidential electronic survey of CBTI/BBTI resources (Appendix I) was conducted across Contiguous United States and the District of Columbia (CONUS) and Outside Continental United States (OCONUS). A list of 154 sleep health care providers across 32 MTFs was assembled by the study investigators for direct email distribution of the digital survey. A link to the survey was also posted on two online military sleep medicine discussion forums, and members were encouraged to complete the survey and share the link to the survey with colleagues. Survey respondents were not compensated for participating in the survey.

Survey respondents were then offered the opportunity to voluntarily complete a brief, 30-minute qualitative interview to further explore their perception of the nature of barriers and facilitators of CBTI at their facility. A \$25 gift certificate was offered to respondents who completed the interviews.

## RESULTS

A total of 52 individuals from 20 MTFs provided survey responses (33.8% response rate). [Table I](#) summarizes respondents' demographic and site characteristics.

Eighty-two percent of responders indicated that the most commonly available treatment modality for insomnia ([Fig. 1A](#)) was medication, and the least common was referral to the off-post civilian network (43%). Respondents indicated offering multiple treatment options, the most common being individual therapy CBTI and BBTI, group BBTI or CBTI class, medication, and sleep hygiene. Four respondents noted not having CBTI or BBTI available at their site, instead utilizing referral to network only ( $n = 3$ ) or medication and sleep hygiene only ( $n = 1$ ).

At facilities where CBTI/BBTI is offered, psychologists (80%), social workers (35%), and physicians (27%) were the primary providers. Although 71% of the respondents reported that two or more health care providers at their facility treated patients with insomnia with CBTI/BBTI, 65% reported that half or fewer of their patients receive CBTI/BBTI. Over one-third of the respondents reported that less than 25% of their patients with insomnia receive CBTI or BBTI ([Fig. 1B](#)).

**TABLE I.** Characteristics of Survey Respondents (*N* = 52) and Reported Sleep Services

	<i>n</i>	%
Military branch		
Army	14	26.92
Navy	16	30.77
Air Force	16	30.77
Joint Forces	5	9.62
Not reported	1	1.92
Professional background		
Physicians	23	44.23
Nurses	2	3.85
Psychologist	18	34.62
Social workers	4	7.69
Sleep technologist	2	3.85
Research-based	2	3.85
Other	1	1.92
Practice location		
MTF	44	84.62
Embedded	4	7.69
Other	4	7.69
On-site sleep laboratory		
Yes	36	69.23
No	16	30.77
Employment status		
Active duty	29	55.77
Civilian	18	34.62
Contractor	4	7.69
Not disclosed	1	1.92
Primary specialty where sleep care is available		
Sleep center or clinic	35	67.31
Primary care	9	17.31
Behavioral health	6	11.54
Unsure/unknown	2	3.85
Primary focus of sleep services offered		
Sleep apnea	15	28.85
Insomnia	5	9.62
Sleep apnea and insomnia	4	7.69
All sleep disorders	25	48.08
Unknown	3	5.77

Respondents ranked order facilitators and barriers to treating insomnia patients with CBTI or BBTI at their facility (Fig. 2). The most impactful facilitator was the availability of an adequate number of clinicians with expertise in behavioral sleep medicine to meet the need and demand for behavioral insomnia treatments (Fig. 2A). The most impactful barriers (Fig. 2B) reported were a lack of clinicians trained in behavioral sleep medicine and that the number of patients with insomnia exceeds the clinical capacity.

**Qualitative Interviews**

Twenty-seven individuals volunteered to complete a semi-structured qualitative interview (Appendix II) to further explore facilitators, barriers, and current CBTI/BBTI resources at their facility. Fifteen providers from 12 MTFs have participated (55% completion). Twelve providers were

unavailable for an interview. Seven interviewees were physicians (47%), four were psychologists (27%), three were social workers (20%), and one was a military research coordinator. There was a representation across branches with seven interviewees affiliated with the Navy (47%), four with the Army (27%), two with the Air Force (13%), and two with a joint facility (13%). Seven themes emerged from the qualitative interviews.

**Theme 1 (barrier): Traditional CBTI/BBTI protocols do not easily integrate into sleep clinics and scheduling requirements**

Eleven of the 15 interviewees have identified at least one specific barrier to their ability to deliver CBTI/BBTI according to the published protocols. Seven providers stated that their current position and duties have limited time for delivering CBTI/BBTI sessions, including part-time assignment to the sleep clinic (*n* = 3), primary focus on other sleep disorders (mainly sleep apnea) or reading sleep studies (*n* = 4), or being focused on conducting sleep assessments only (*n* = 1). Three providers reported not being able to offer CBTI appointments to their patients because of one or more of the above. Six providers shared that their clinical schedule prevented them from offering consecutive weekly treatment visits and, therefore, are unable to adhere to the traditional CBTI/BBTI protocols.

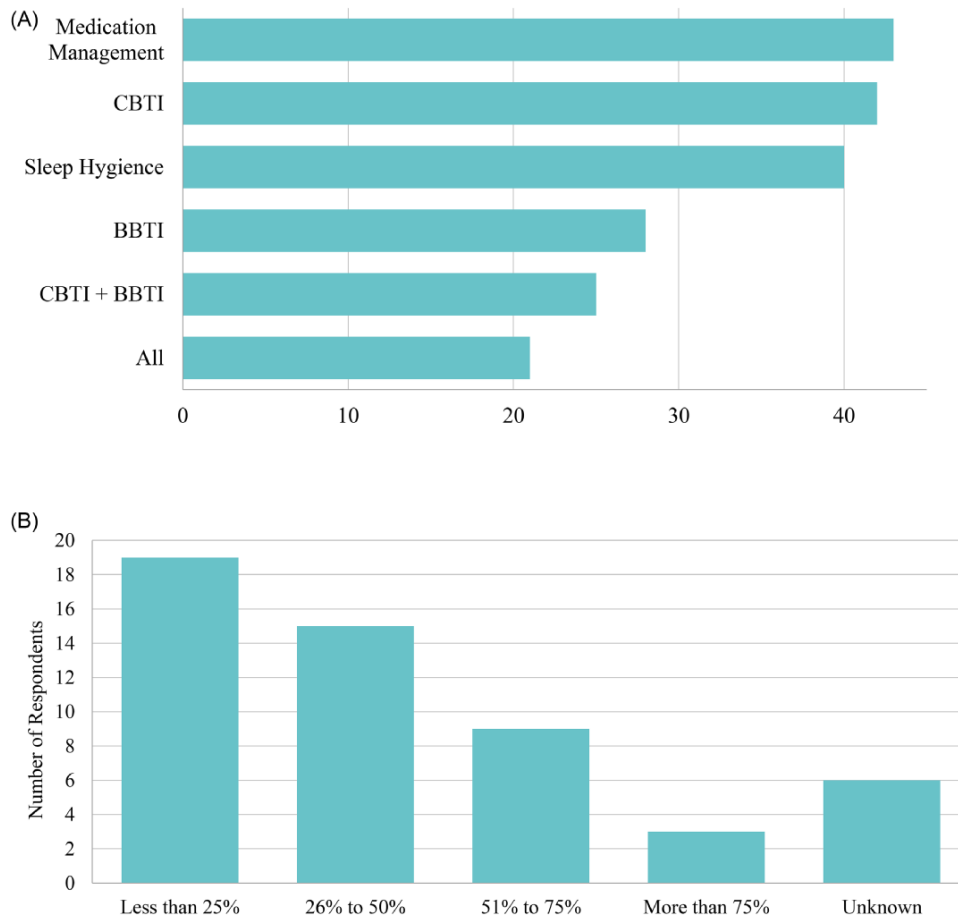
Five interviewees provided examples of scheduling practices allowing for return appointments for service members every 2 to 4 weeks only, limiting the timeliness of support and recommendations they can provide to patients.

One provider noted that although telehealth visits are helpful for service members assigned to remote locations, scheduling telehealth follow-up visits for CBTI/BBTI is equally challenging. The other four interviewees stated that their clinical scheduling allowed for regular CBTI/BBTI appointments, including one delivering CBTI/BBTI in the context of clinical research projects only.

**Theme 2 (facilitator and barrier): Group CBTI/BBTI scales access to insomnia care has shortfalls**

Eleven of the 15 interviewees reported utilizing treatment groups to meet the high demand for insomnia care. Eight reported that groups are the primary CBTI/BBTI format at their facility. Three of the eight reported also offering individual CBTI/BBTI sessions when their schedule permitted. One provider reported supplementing with self-help apps for individuals for whom group format was not well suited (e.g., senior personnel).

Seven providers identified dissatisfaction with treatment groups. Two providers reported better sleep outcomes in patients treated with individual CBTI/BBTI vs. in a group format, and two reported lower engagement and adherence to treatment in groups. Three providers pointed out that



**FIGURE 1.** Insomnia treatment options and access according to survey respondents. (A) The number of survey respondents reporting the availability of different insomnia treatment options at their facility. (B) Estimated percentage of patients who receive cognitive-behavioral treatment of insomnia or brief behavioral treatment of insomnia.

“insomnia groups” or “insomnia classes” often focus primarily on sleep hygiene and include minimal review of core CBTI/BBTI techniques such as stimulus control and sleep restriction.

**Theme 3 (barrier): There are too few CBTI-trained providers**

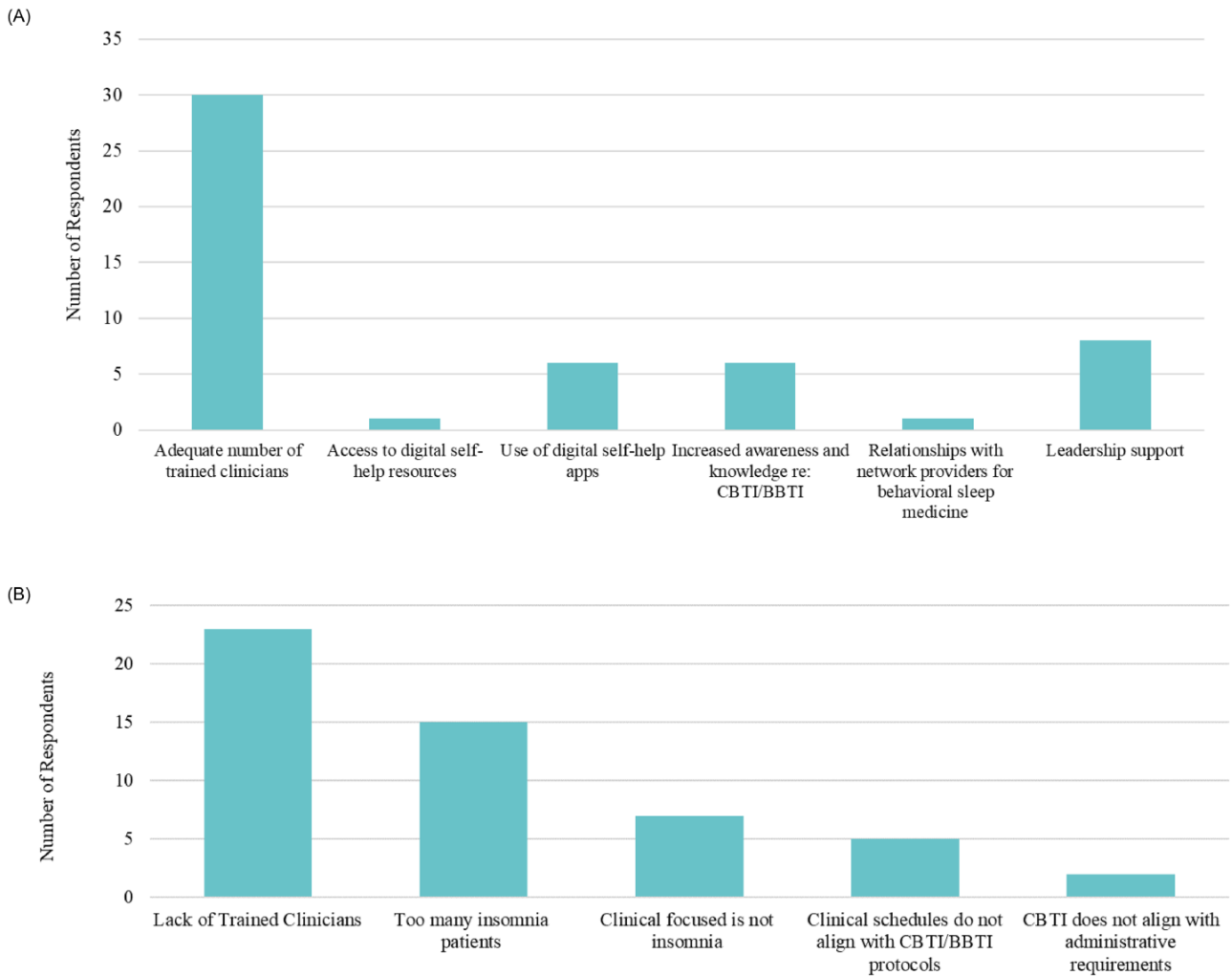
Eleven of the 15 providers highlighted that there are too few trained CBTI/BBTI providers to meet the current demand at their facility and that this scarcity is more pronounced in remote settings. Three providers estimated that one to three additional full-time CBTI providers would be needed at their facility to meet the current demand for insomnia care. Of note, two providers stated that their facility had adequate personnel to meet demands for insomnia care: Both had a sleep medicine or psychology training program embedded within their facility. Although both highlighted the benefits of their embedded training sleep programs, one provider also commented that fellows and interns lead the majority of CBTI efforts, which result in a recurring gap in clinical services at the end of the academic term.

**Theme 4 (facilitator and barrier): Referral to the external network does not effectively augment access**

Five providers noted that they had an option to leverage off-post civilian network referrals to augment sleep services at their facility. However, none currently used this option because (1) the network did not have available CBTI providers ( $n = 4$ ), (2) they were uncertain about the quality of care ( $n = 2$ ), or (3) network referral resources focus on the diagnosis of sleep apnea only ( $n = 1$ ). Even when providers who offer CBTI/BBTI were available, four providers noted that these providers are usually not taking new patients or turn down referral requests because of lower reimbursement rates from TRICARE ( $n = 1$ ). Two providers also commented that other CBTI providers in their area do not accept insurance.

**Theme 5 (facilitator): Embedding a trained CBTI provider outside the sleep clinics could effectively scale delivery and accelerate access to CBTI/BBTI**

Thirteen of the 15 interviews stated that CBTI/BBTI services could be available at points of care outside the sleep clinic. One interview illustrated this point by stating: “Expecting the



**FIGURE 2.** Facilitators and barriers of cognitive-behavioral treatment of insomnia (CBTI)/brief behavioral treatment of insomnia (BBTI) according to survey respondents. (A) Most impactful facilitators of CBTI/BBTI according to survey respondents. (B) Most impactful barriers to CBTI/BBTI according to survey respondents.

sleep doc to provide CBTI is like expecting the orthopedic surgeon to provide physical therapy.” Ten interviewees identified primary care as being the best-fitting clinical setting for expansion of CBTI services. Providers highlighted that, at their facility, insomnia is most commonly identified in this setting and provides the majority of patient referrals. Primary care was described as readily accessible to service members (i.e., has the greatest reach), would avoid referral for specialty care as well as potentially avoid the stigma associated with specialty referrals, and thus, may have the greatest impact of accelerating access to CBTI/BBTI.

Three downsides to expanding CBTI/BBTI in primary care were also noted. Three providers reported concerns about disrupting the continuity of sleep care or creating communication breakdowns. Two providers cited concerns about quality control, noting that there is variability in what constitutes CBTI/BBTI. Finally, four providers cautioned that primary care providers also have limited time and availability

to offer CBTI/BBTI. Providers shared examples of how the utilization of integrated behavioral health consultants in primary care, with proper training in behavioral sleep medicine, could improve access, efficiency, and continuity of care, especially for patients with comorbid obstructive sleep apnea or psychiatric conditions.

Other clinics suited for the inclusion of CBTI/BBTI services included behavioral health ( $n = 3$ ), health and wellness clinics ( $n = 1$ ), and women’s health clinics ( $n = 1$ ). One provider suggested that basic sleep education should be available at all points of care since insomnia is commonly comorbid with another sleep, medical, or psychiatric condition. For example, in their words, “Every behavioral health clinic should have someone. One psychologist can’t treat everyone in their clinic and not every patient needs a sleep clinic. Behavioral health should know how to triage insomnia.” Another provider stated, “It’s actually hard to imagine a place where CBTI couldn’t be implemented....”



**Theme 6 (facilitator): To benefit providers and service members, augmentation efforts and digital solutions must accommodate the unique characteristics and requirements of military health care**

Additional training and utilizing digital CBTI tools ( $n = 13$ ) were identified as strategies to augment clinicians' capacity. Three providers stated that increased opportunities for training in behavioral sleep medicine could be helpful, but two also noted that training requires a non-negligible time commitment. Two additional providers shared that having a CBTI specialist does not necessarily translate into applied practice of CBTI, with one CBTI-trained provider explaining the challenge of offering a full course of CBTI while also adhering to scheduling and other departmental policies, such as a maximum number of 12 sessions allowed. In their words, "Most people do not come with just sleep problems. None of our patients are sleep only patients. This means taking care of several problems. We're set up as a short term treatment clinic. If you focus on sleep, you will use half of the allowance."

Six providers shared that although they have or currently offer online and app-based self-help programs, they did not consider these as an effective stand-alone option. Six respondents identified that the lack of or difficulty accessing patients' data collected from the self-help apps limits their utility. Five respondents did not consider that self-help apps could significantly alleviate the time burden of CBTI/BBTI for patients and clinicians. Four providers shared that the most helpful feature of these digital tools is the electronic sleep diary ( $n = 4$ ), followed by the embedded relaxation skills, but also stated that these tools alone are not a replacement for CBTI/BBTI. Two respondents perceived that the best use of these digital tools was as an introduction to CBTI, and four considered these helpful as an adjunct to face-to-face treatment. Finally, providers experienced that many patients do not independently adopt or consistently use self-help apps.

**Theme 7 (gap): Assuring the quality and continuity of sleep care**

Eleven interviewees emphasized the importance of assuring the quality as well as the continuity of sleep care. For internal or external referrals, as well as for self-help apps, providers reported quality concerns because of the utilization of CBTI vs. "sleep hygiene" classes or tools, the limited information regarding standardization in insomnia care or utilization of quality metrics, and shared clinical outcomes from internal or external providers. Two providers identified gaps in the integration of sleep and behavioral medicine records to assure the care coordination. Many stated that there are currently no user-friendly and real-time communication tools among providers to share information about insomnia care.

The theme of quality was also raised during discussions regarding facilitators and specifically the addition of dedicated CBTI providers at MTFs. Assuring the quality of the training, proficiency of newly trained providers, availability of consultation support offered to newly trained providers, and regular assessment of outcomes in both group and individual therapy were identified as strategies to monitor, and hence assure, the quality of CBTI/BBTI services. Five providers suggested that continuity of care and patient experience may be ameliorated by integrating CBTI/BBTI at their main point of care (e.g., primary care, behavioral health clinics, and pain management clinic).

**DISCUSSION**

The objective of this effort was to map available resources and current practices and identify perceived facilitators and barriers to the delivery and access of the first-line recommended treatment of insomnia, CBTI, and its abbreviated format, BBTI, across MTFs. We conducted an electronic survey and semi-structured qualitative interviews to investigate facilitators and barriers to delivery and access to CBTI/BBTI in MTFs. We assembled a list of 154 possible respondents who provide sleep-related care in the DHA, of whom 52 completed the confidential electronic survey (33.8% completion rate). The completion rate of the survey is consistent with the extant literature.<sup>27</sup>

Survey results suggest the following:

**(1) The Delivery and Access to CBTI/BBTI Remain Limited by an Insufficient Number of Trained Providers Available to Meet the High Volume of Patients Diagnosed With Insomnia**

The shortage of trained providers in MTFs and affiliated clinics mirrors the scarcity of specialists in the civilian health care sector and globally. Specifically, there are fewer than 600 registered CBTI specialists worldwide (see: [https://www.med.upenn.edu/cbti/provider\\_directory.html](https://www.med.upenn.edu/cbti/provider_directory.html), retrieved 4/4/2023). There are many online and in-person didactic resources and trainings available to existing qualified providers to acquire knowledge and skills to deliver CBTI/BBTI to their patients (e.g., Path to Better Sleep; CBTI Coach, and Insomnia Coach). Large-scale training and dissemination efforts in the VA<sup>28</sup> and DoD<sup>29</sup> that include rigorous processes for training, supervision, and certification of newly trained clinicians have shown unequivocal feasibility and positive patient clinical sleep outcomes.<sup>28</sup> However, the long-term impact of these efforts on the retention of CBTI clinicians and the effective impact of accelerating patients' access to CBTI/BBTI over time are unclear. Although high-quality trainings, consults, and supervision, as well as competence and proficiency certifications, are necessary to assure quality and safety, retention of expertise and continuity of patient care may be impeded by systemic competing demands such as those highlighted in this survey and interviews. Continued training of health care providers, publication of lessons learned from recent efforts,

education about the prevalence and impact of insomnia and readiness and health, paired with leadership engagement are keys to overcoming barriers to behavioral sleep care in the DHA.

## **(2) Hypnotic Medications Remain the Primary Insomnia Treatment, Despite the Associated Risks**

Hypnotics remain the most used insomnia treatment, despite being associated with non-negligible risks, including increased risk of motor vehicle accidents and complex behaviors during sleep and cognitive impairments.<sup>11</sup> This is consistent with previous studies reporting hypnotic usage rates as high as 25%,<sup>30</sup> among which zolpidem and trazodone<sup>10</sup> are the most commonly prescribed. Of note, hypnotics are prescribed intermittently and for short duration in active duty service members consistent with practice guidelines for the pharmacological treatment of insomnia.<sup>31</sup> However, recurrent episodes of insomnia may increase the risk of chronic insomnia, and thus, behavioral interventions should be required for recurrent acute insomnia, as there is only weak evidence for the treatment of insomnia with zolpidem, eszopiclone, and temazepam and weak recommendation against the use of trazodone.<sup>31</sup>

## **(3) Efforts to Scale CBTI and Accelerate Access to Care Such as Group Sessions, Self-help Apps, and Referrals to Networks Are Perceived as Yielding Inferior Engagement and Clinical Outcomes**

Eighty percent of survey responders stated that CBTI/BBTI was available at their facility, in individual or group format. However, a majority of interviewed providers who used groups voiced dissatisfaction with this format. Group CBTI/BBTI can increase the efficiency of delivery and has been shown to be efficacious<sup>32</sup> relative to a control group condition. Head-to-head comparisons have typically shown superior outcomes in individual vs. group format<sup>33,34</sup>; however, to our knowledge, comparative effectiveness trials of individual vs. group CBTI have not been conducted in active duty military populations.

We anticipated a greater utilization of self-help apps and external referrals to the off-post civilian providers to augment CBTI/BBTI access and resources. However, both self-help apps and external referrals were identified as the least impactful CBTI/BBTI facilitators. Perceived pitfalls for both strategies included a lack of quality assurance, limited patient engagement, and poorer clinical outcomes. Large-scale data regarding patient engagement and clinical outcomes in military populations for commonly used self-help digital tools such as Path to Better Sleep, CBTI Coach, and Insomnia Coach are not yet available. Pragmatic clinical trials are needed to ascertain who benefits from these self-management tools and who may require supervised care. Additionally, allowing health care providers to prospectively monitor engagement and clinical outcomes could assuage

concerns regarding the use of self-help apps and maintain continuity of care between providers and patients. Similarly, establishing quality processes and metrics, and effective communication channels between military providers and external providers, may address concerns regarding the quality of insomnia care delivered to service members.

## **Limitations and Future Directions**

The convenience sample of providers distributed across 20 MTFs with known affiliations to sleep medicine in MTFs and clinics may have limited the scope of the findings and perceived barriers and facilitators of CBTI/BBTI across a wider range of providers and MTFs. The extent to which this sample is representative of other MTFs is unknown. We focused on this sample because we surmised that providers would be most familiar with the recent VA/DoD guidelines for the management of insomnia and best positioned to identify current behavioral sleep medicine practices. Nevertheless, it is possible that they are not fully generalizable to the CBTI/BBTI experiences and practices in other MTFs. Moreover, we are aware of efforts to train behavioral health consultants to deliver BBTI in primary care and did not have direct access to these providers. As integrated behavioral health consultants were offered as an observed effective mechanism to assist with insomnia treatment and upstream prevention (theme 5), an understanding of facilitators and barriers to implementing BBTI faced by this subset of providers may have provided insights not captured herein. Additionally, the voluntary nature of the survey and qualitative interviews inherently influences the generalizability of the findings. Command-level endorsement and command-directed participation in future surveys and interviews should be pursued to enhance sampling and generalizability. Replications with a larger number of MTFs will be required for a more accurate sampling of CBTI/BBTI resources, barriers, and facilitators. Although the scope of the present study did not allow for hierarchical modeling, larger survey studies should consider this more sophisticated approach to identify level-specific trends (e.g., provider type, clinic specialty, MTF, and geographical location) as well as factors that may impact resources availability over time.

## **RECOMMENDATIONS**

Based on the above survey and interview responses, we put forward eight recommendations for augmenting capabilities in behavioral sleep medicine, with a specific focus on CBTI.

1. Continue efforts to educate and offer certifications of qualified health care providers across disciplines on clinical practices and guidelines for the treatment of insomnia with CBTI/BBTI.
2. Identify, train, and embed behavioral health providers across all points of care to assess and triage sleep disorders and provide CBTI upstream from sleep clinics.

3. Ensure that the VA/DoD Clinical Practice Guidelines reach a wide array of health care providers and/or offer expert consults for newly trained providers. As the DHA does not have focused behavioral insomnia services, coordination with network providers who can provide evidence-based, just-in-time insomnia treatment can help address the current gaps. Ideally, such services would leverage technology to facilitate access for service members who frequently cannot attend in-person treatment because of their demanding military schedules. Implementation and adoption within the DHA and VA will require adjusting workflow requirements to allow trained CBTI providers to deliver BBTI/CBTI as recommended. Creating specialized clinics or identifying dedicated personnel for CBTI/BBTI—and including these as part of a stepped-care approach—would also augment implementation success and support the efficient use of resources.
4. Engage DHA and VA leadership to encourage more providers to be trained in CBTI/BBTI and foster local champions to sustain implementation, augment CBTI capabilities, and accelerate access to CBTI.
5. Identify and adopt mechanisms to streamline time-intensive elements of CBTI (e.g., patient sleep data collection, sleep metric calculations, and follow-up sessions), including leveraging providers' interest in technology through the use of CBTI digital clinical support platforms.
6. Create more robust external referral options for service members, especially in “CBTI deserts” or remote locations where service members are located, and that are not cost-prohibitive for service members and economically reasonable for providers.
7. Implement process and quality metrics to ascertain that the quality of care delivered to service members in the external network and/or via digital health technology is non-inferior to individual CBTI on patient engagement, retention, and outcomes.
8. Encourage the distribution of findings from past and/or ongoing CBTI/BBTI dissemination and implementation efforts (such as the training of behavioral health consultants to deliver BBTI in primary care) to increase awareness and scale delivery and access to evidence-based behavioral sleep care.

### ACKNOWLEDGMENTS

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### SUPPLEMENTARY MATERIAL

Supplementary material is available at *Military Medicine* online.

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### CONFLICT OF INTEREST STATEMENT

A.G. is the Founder and CEO and owner of NOCTEM Health, Inc. M.W. is employed by NOCTEM. V.M. is currently employed by BioSerenity and has served as a consultant for Armed Forces HST, CPAP Medical, Jazz Pharmaceuticals, Mindstrong, NOCTEM Health, and SleepCare Inc.

### DATA AVAILABILITY

The data that support the findings of this study are available on request from the corresponding author.

### CLINICAL TRIAL REGISTRATION

Not applicable.

### INSTITUTIONAL REVIEW BOARD (HUMAN SUBJECTS)

The study received an exempt determination by Advarra, Inc., an independent institutional review board, on July 14, 2022.

### INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE (IACUC)

Not applicable.

### INDIVIDUAL AUTHOR CONTRIBUTION STATEMENT

A.G., B.O., M.S.B., and H.H. designed the study. A.G., M.W., and V.M. designed the survey. A.G., M.W., and B.K. completed the data analysis. All authors contributed to the writing of the manuscript. All authors read and approved the final manuscript.

### INSTITUTIONAL CLEARANCE

Institutional clearance approved.

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