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Innovations in Practice

Development of a guide for continuous positive airway pressure use - A good fit: Making continuous positive airway pressure work for you

Adeel Meraj[1,2a], Lauren Koep[2], Muhammad R. Baig[2,3,4]

[1] Sleep Medicine Section, Medicine Service, South Texas Veterans Health Care System, [2] Mental Health, South Texas Veterans Health Care System, [3] Polytrauma Rehabilitation Center, South Texas Veterans Health Care System, [4] Psychiatry and Behavioral Sciences, The University of Texas Health Science Center at San Antonio

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Abstract

Background

Obstructive sleep apnea (OSA) is highly prevalent in veterans with mental illnesses such as post-traumatic stress disorder (PTSD). Untreated OSA reduces the effectiveness of the treatment of PTSD. Treatment of OSA has been shown to reduce daytime sleepiness and symptoms of PTSD and depression. Continuous positive airway pressure (CPAP) therapy is the most effective treatment for OSA. A large number of veterans cannot tolerate CPAP therapy due to anxiety and PTSD symptoms. Positive airway pressure (PAP) NAP, a daytime sleep study for patients with anxiety about starting CPAP and exposure-based cognitive behavioural interventions are the mainstay for the management of CPAP intolerance. However, these options are not readily available to veterans in rural areas, who constitute about 40% of veterans registered in the South Texas Veterans Health Care System (STVHCS).

Methods

After getting local IRB exemption, we surveyed thirty (30) veterans in the outpatient clinic setting who could not tolerate CPAP therapy to evaluate the need for a tool to improve CPAP adherence. We reviewed the literature and conducted focused group meetings with local and national experts. We also convened consumer groups and stakeholder meetings, including primary care, sleep medicine, and mental health providers.

Results

After a comprehensive evaluation process, we compiled a concise self-help guide combining principles of cognitive behavioural therapy using a behavioural hierarchy approach towards CPAP desensitization. This guide can be used by veterans independently at their homes to improve CPAP use. A printer-friendly version is available for download on the South Central Mental Illness, Research, Education and Clinical Center (SC MIRECC) and the South Texas Veterans Healthcare System (STVHCS) website. The guide will be provided to veterans during the initial CPAP setup and available in clinic waiting rooms throughout the system.

Conclusion

Our guide will serve as an effective self-help tool to improve CPAP adherence. It may result in the improvement of various medical and psychiatric conditions.

a Corresponding author: Adeel Meraj, M.D., Mental Health, South Texas Veterans Healthcare System, 116 A, 7400 Merton Minter Blvd, San Antonio, TX, USA. Email: adeel.meraj@va.gov

INTRODUCTION

Obstructive sleep apnea (OSA) is a chronic condition characterized by recurrent partial (hypopneas) or complete (apneas) upper airway collapse during sleep despite good effort to breathe.[1] OSA affects 17% to 34% of U.S. adults ages 30 to 70 years.[2] Clinical features of OSA include loud snoring disruptive to bedpartner, witnessed apneas, nightly gasping/choking, and hypertension (reported in Table 1).[1] Patients frequently report symptoms of poor sleep quality, excessive daytime sleepiness, nocturia, non-restorative sleep, and fatigue.[3,4] OSA severity is categorized as mild, moderate, and severe based on the number of apnea and hypopnea episodes per hour of sleep (shown in Table 2).[1] Untreated OSA may lead to medical and psychiatric conditions including cardiovascular disease,[5,6] metabolic disorders,[6,7] psychiatric disorders,[6,8] motor vehicle accidents,[6,9] and all-cause mortality.[6,10]

Currently, no medications have been approved by the U.S. Food and Drug Administration (FDA) for treating OSA (Since the article was submitted FDA recently approved Trizepatide under the brand name Zepbound for treating moderate to severe OSA). Current evidence suggests CPAP therapy for the management of OSA.[11-13] The Department of Veterans Affairs/ Department of Defense (VA/DoD) practice guidelines recommend continuous Positive Airway Pressure (CPAP) therapy as first-line treatment for OSA.[1,4,14]

Despite being the most effective treatment available, many patients, especially combat veterans, find it difficult to use CPAP consistently.[15] Unfortunately, more than 60% of veterans with PTSD cannot tolerate CPAP therapy[14] due to worsening anxiety symptoms and claustrophobia associated with CPAP, leading to non-adherence.[6,14]

Alternative treatment for OSA, approved by the FDA, include oral appliance therapy (OAT),[16] daytime neuromuscular electrical stimulation of the tongue,[17] nasal expiratory positive airway pressure) therapy,[18,19] and hypoglossal nerve stimulation therapy.[20] OAT, also known as mandibular advancement device, utilizes a custom-made dental device designed by a dentist. OAT works by protrusion of the mandible and creating more space at the back of the throat, which prevents collapse of tongue and soft tissue of the airway.[16] It is a treatment option for mild to moderate OSA for patients who are unable to tolerate CPAP. However, according to the literature, OAT may be less effective for severe OSA.[16] Neuromuscular electrical stimulation of tongue muscle is the first daytime treatment of primary snoring or mild OSA (AHI 5-14/hr). This device has a mouthpiece connected to a unit controlled by a cell phone application. It delivers an electric current through the electrodes over the specific tongue areas, stimulating the tongue's intrinsic and extrinsic (genioglossus) muscles. This strengthens the tongue muscles' cytoskeleton, preventing tongue collapse during sleep and eliminating snoring and airway closure.[17]

Patients start using the device for 20 minutes daily for six weeks, followed by 20 minutes twice weekly at any time of the day. However, it is neither approved for moderate or severe OSA nor evaluated in veterans with PTSD. Nasal expiratory positive airway pressure is a prescription device for treating mild to moderate OSA. It consists of a valve attached or inserted into the nostrils with adhesive. Nasal EPAP provides an expiratory resistance (80 cmH20/L/sec at a flow of 100mL/sec). It uses patients' breath to create pressure as they exhale, reducing the periods of lapsed breathing by preventing or reducing upper airway collapse. The most commonly reported side effects are difficulty exhaling, nasal discomfort, dry mouth, headache, and insomnia.[18,19] Studies evaluating long-term use in veterans with PTSD are lacking.

Hypoglossal nerve stimulation is the only FDA-approved non-CPAP surgical treatment for moderate to severe OSA. This is a pacemaker-like pulse generator with sensors surgically implanted between the external and internal intercostal muscles to detect ventilation effort and a lead implanted below the chin to stimulate the hypoglossal nerve for protrusion of the tongue. When activated by remote control before sleep, it gently simulates the hypoglossal nerve to keep the airway open. Major limitations are the requirement of general anesthesia, pre-surgical drug-induced sleep endoscopy with conditional MRI compatibility, and strict range of body mass index. Therefore, it is considered a salvage option for those who have tried and exhausted the gold standard CPAP therapy.[20] Other surgical options may include modification of upper airway soft tissue. There are no studies to evaluate the effectiveness in PTSD patients.

OSA is highly prevalent in veterans with post-traumatic stress disorder (PTSD)[3] probably due to low arousal threshold and higher arousal sensitivity during breathing events. Recent data suggest a bidirectional relationship between PTSD and OSA. Veterans with PTSD report trouble initiating and maintaining sleep, nightmares, dream enactment behaviours, and leg jerks.[6,21] Sleep fragmentation may enhance airway collapse, leading to increased arousal from sleep.[6,22] REM-sleep fragmentation in OSA is shown to negatively impact the response of trauma-focused therapies, which are highly effective but already under-utilized.[6,23-28] Studies show veterans may be more willing to seek sleep medicine treatment over PTSD-focused therapies.[6,29,30] Studies show a positive impact of OSA treatment with CPAP in those with co-morbid PTSD. A retrospective review found that 75% of those using CPAP reported improvement in PTSD-related symptoms. In contrast, those who declined it reported worsening symptoms.[6,31] Despite well-established efficacy, CPAP adherence remains a challenge, especially in combat veterans. An adherence rate of 40% is reported in patients with PTSD compared to 70% in the general population at 30-day follow-up.

Common reasons for non-adherence to CPAP use are mask-related discomfort, aerophagia, intolerance to pressure, and claustrophobia.[6,14] Claustrophobia, a fear of closed spaces, has been reported as the most significant deterrent to CPAP therapy in many studies.[32-34] Claustrophobia tendencies reported on a standardized assessment predict less likelihood of CPAP use for more than 2 hours every night.[34-37]

Table 1. Obstructive Sleep Apnea ICSD-3 Diagnostic Criteria in Adults: A and B or C satisfy the criteria

A: The presence of one or more of the following:	1. The patient complains of sleepiness, nonrestorative sleep, fatigue, or insomnia symptoms. 2. The patient wakes with breath-holding, gasping, or choking. 3. The bed partner or other observer reports habitual snoring, breathing interruptions, or both during the patient's sleep. 4. The patient has been diagnosed with hypertension, a mood disorder, cognitive dysfunction, coronary artery disease, stroke, congestive heart failure, atrial fibrillation, or type 2 diabetes mellitus.
B: Polysomnography (PSG) or Out of Center Sleep Testing (OCST) demonstrates:	1. Five or more predominantly obstructive respiratory events per hour of sleep during PSG or per hour of monitoring (OCST).
C: PSG or OCST demonstrates:	1. Fifteen or more predominantly obstructive events per hour of sleep during PSG or per hour of monitoring (OCST)

Table 2. OSA Severity Classification by Apnea Hypopnea Index (AHI).

Apnea Hypopnea Index (AHI)	Severity
0-4	No OSA
5-15	Mild OSA
15-29	Moderate OSA
30 ≥	Severe OSA

CPAP desensitization, a graded exposure, is a safe and effective technique to improve CPAP tolerance due to claustrophobia.[32] In vivo desensitization has been shown to alleviate claustrophobia associated with CPAP use and improve compliance.[38] Studies have suggested that the initial presentation of CPAP in a supportive and controlled environment, such as a sleep laboratory, may improve long-term adherence.[35,39] With the introduction of out-of-center sleep testing and newer auto-titrating CPAP devices, many patients are not being titrated on CPAP in sleep lab settings, which may affect tolerance and long-term compliance.

A randomized trial of a novel cognitive behavioural therapy intervention compared to education showed longer "mask on" time with the CPAP therapy in veterans with comorbid PTSD and OSA.[40] A 3-month comparison of motivational enhancement versus the control group showed CPAP use of more than 3.2 hours every night.[41,42] A meta-analysis of 11 randomized controlled trials reported favourable effects on CPAP tolerance of motivational interventions.[43]

CPAP underutilization is a significant problem, especially among veterans across the VA healthcare system. Respiratory Therapists (RTs) play a crucial role in managing patients with CPAP intolerance. In the VA healthcare system, RTs are the first providers to explain how CPAP works, conduct a proper mask fitting, show how to put on/take off the mask, and provide continuity of care to veterans.

Sleep medicine and behavioural health leaders agree that psychological and medical interventions must be integrated with CPAP treatment to improve tolerance and outcomes. Effective psychological interventions, such as CPAP desensitization, remain under-utilized in veterans, likely due to a lack of awareness of its efficacy and the availability of trained providers who can deliver this intervention.

The South Texas Veterans Healthcare System (STVHCS) has a multidisciplinary sleep disorder center that provides care to veterans with OSA and co-morbid mental illnesses such as PTSD. Positive airway pressure (PAP)-NAP, a daytime sleep study for patients with anxiety and claustrophobia due to CPAP use, and cognitive behavioural interventions are clinical standard of care for CPAP intolerance. However, about 40% of registered veterans reside in rural settings more than an hour from the STVHCS. Their inability or unwillingness to travel hinders efforts to identify and address CPAP intolerance.

A few manuals and resources developed by the VA provide general information about OSA and the importance of CPAP adherence. Furthermore, those resources cannot be used as self-help tools by patients. The resources require the presence and intervention of a trained behavioural therapist. Thus, we propose a comprehensive yet concise CPAP desensitization tool based on the principles of exposure-based cognitive behavioural interventions for veterans with trauma and stress-related disorders that veterans with assigned respiratory therapists can use. The administration of this resource will not require a trained behavioural health provider.

PROJECT OBJECTIVES

This project is supported by a clinical educator grant program of the South-Central Mental Illness Research, Education, and Clinical Center (SC MIRECC), a MIRECC for Veterans Integrated Service Network 16 & 17. The overall aim of the SC MIRECC clinical educator grant program is to develop products to improve the access, quality, and outcome of mental health and substance abuse treatment for underserved veterans. We achieved MIRECC goals by developing a comprehensive yet concise self-desensitization guide for veterans with trauma and stress-related disorders to improve CPAP compliance.[44] This guide was developed after a careful review of available literature, guidelines, and results of qualitative interviews with primary care, rehabilitation, sleep medicine, and mental health providers in focus groups, as described in the sections below.

METHODS

DEVELOPMENT AND PILOTING OF THE TOOL

SETTING AND TEAM

The multidisciplinary sleep disorder center at STVHCS provides full-spectrum sleep care, including sleep apnea, to VA patients. Veterans are assigned to the facility's patient-aligned care team (PACT) under the care of primary care providers. A referral from PACT is generated when there is a concern for sleep apnea. The facility's sleep disorder center physicians evaluate the patient for a sleep study based on a comprehensive chart review and an online sleep history questionnaire completed by the veteran. The sleep disorder center at the STVHCS can offer in-lab polysomnogram and out-of-center sleep testing. This is followed by a referral to a sleep outpatient clinic for mild to moderate cases of sleep apnea to discuss the results of the study and treatment options.

Patients with severe sleep apnea are referred for CPAP treatment, the most effective treatment, at the CPAP clinic. An RT administers the treatment under the supervision of a board-certified sleep physician. Veterans are proactively monitored in the CPAP clinic to confirm they are using therapy as intended based on data transmitted by the CPAP machine wirelessly to the CPAP clinic. If veterans are using the CPAP therapy as intended, they are followed annually. If veterans are not using the CPAP therapy, they are contacted by the RT to troubleshoot and help improve compliance. PTSD is the most common co-morbid mental health condition. The multidisciplinary sleep disorder center at the STVHCS has adopted a collaborative care model which includes a behavioural sleep medicine-trained therapist and the ability to coordinate care with the PACT and PTSD care team. Both A.M. and M.R.B. are staff physicians who are board-certified psychiatrists with subspecialty certification in brain injury medicine. Additionally, A.M. is fellowship-trained and board-certified in sleep medicine.

PROCESS FOR IDENTIFICATION OF GUIDE CONTENT

A literature review was conducted and guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) reporting guidelines.[45] The National Library of Medicine through PubMed was searched for CPAP intolerance, sleep apnea with co-morbid PTSD, behavioral interventions for CPAP intolerance. In addition, we searched the following databases for the terms sleep apnea AND PTSD AND CPAP intolerance AND claustrophobia with CPAP AND behavioural interventions for CPAP intolerance: Web of Science, Cochrane, Library, CINAHL, Plus, ClinicalTrials.gov, Conference Papers Index, Gideon, PsychINFO, and Google Scholar. Our search strategy included studies published in any language. References of identified articles were searched for additional relevant articles. Articles were reviewed based on the strength of supporting evidence. We searched for pertinent studies and drew on our clinical experience to provide clinical applications. We also conducted a literature review of current VA/DoD practice guidelines for the management of OSA and Insomnia, International Classification of Sleep Disorders, 3rd edition[1,15] for symptoms of OSA, and reference books.

To ensure the clinical utility of the content, we organized focus groups and in-person meetings of knowledge users and leadership of primary care, sleep medicine, psychiatry, psychology, physical medicine and rehabilitation services, and VA Innovator's Network specialists. We also sought input from several weekly and monthly meetings at the psychiatry, psychology, CPAP committees, rehabilitation medicine, and primary care services. Participants of focus groups were provided with canteen vouchers.

CONTENT AREAS

As requested by SC MIRECC, the material was developed using person-centred language, free of stereotypes, overgeneralizations, or gender/race/LGBTQ bias. One of the SC MIRECC experts recommended that pictures of someone wearing a CPAP be added to normalize the user's experience. Images of people with diverse racial backgrounds and genders were used to accomplish this. Many veterans initiated on CPAP do not see a board-certified sleep physician. Therefore, the resource material began with an easy-to-understand layperson's introduction about what sleep apnea is, how it is diagnosed and affects our body, why it is important to treat, and how CPAP helps to treat it.

A section providing common obstacles to using CPAP and initial troubleshooting tips to resolve any technical or equipment-related problems with the help of an RT was provided. A section on local CPAP clinic contact information was included based on feedback from the consumer advisory board. At the request of a sleep medicine provider, tips for better sleep and a brief overview of lifestyle changes to treat OSA are provided in Table 3.

Before starting with formal CPAP desensitization, an overview of unhelpful thoughts about CPAP, cognitive distortions, and ways to recognize, challenge, and change those thoughts was provided, along with relaxation strategies such as guided imagery.

A brief introduction about the process and goals, followed by a 4-step CPAP self-desensitization protocol, was provided using the exposure hierarchy approach. Step-by-step guidance was supplied if a person is not progressing, as shown in Table 4. A list of useful online resources from reputable sources was also provided.

DESIGN, EDITING, AND PRINTING

After considering feedback from focus groups, we finalized a colour guide in portable document format (PDF), which can be easily printed and shared with patients in a clinic or via secure messaging and downloaded from the website. Baylor College of Medicine's media specialist designed the guide with our continuous input during several discussions and electronic correspondence. The multimedia expert provided two different proofs. The SC MIRECC provided a professional medical writer's copy editing services, and the guide was printed at the STVHCS.

Table 3. Lifestyle changes to treat OSA.

Tip	Lifestyle change
Tip 1	Losing weight. Even a slight weight loss of 5% may have a positive effect and reduce the number of times you stop or have slowed breathing in your sleep.
Tip 2	Avoid sleeping on your back. When you sleep on your back, your tongue falls back due to gravity and blocks the airway during sleep. Sleeping on your side will improve your AHI significantly and may even stop mild sleep apnea. If you tend to roll back, sew a pocket in the back of your pyjama top or nightgown. Put a tennis ball into the pocket and stitch the pocket shut. This will keep you from sleeping on your back. A sleep positional belt may also be used, and your primary care physician or CPAP RT can order one for you.
Tip 3	Sleep with the head of the bed elevated to a 30-degree angle, or use a wedge pillow.
Tip 4	Stop using alcohol at least two hours before bed. Alcohol and certain sleeping pills can relax your throat muscles even more and suppress breathing in your sleep.

Table 4. CPAP Desensitization: Patient Protocol.

Step 1. The goal is to become comfortable with your CPAP mask alone (not connected to the machine) while awake.	**Mini-step A**: Hold the mask against your face without the strap for up to five minutes. Do not attempt to use the machine. Increase the length of time you hold the mask against your face, up to 15 minutes each day. **Mini-step B**: Strap the mask on the face in the evening; leave it on, but don't connect it to the machine. You can walk around, watch TV, and do chores with the mask on your face. Start with 15 minutes, and progress to one hour each day.
Use "Helpful Thoughts about CPAP" and "Relaxation Strategies" while practicing these steps. ↕	
Step 2. The goal is to become comfortable with the CPAP mask and machine while awake.	**Mini-step A**: Place the mask on your face, attach it to the CPAP machine, turn on the unit, and practice breathing while you do activities in which you don't move much, such as watching TV, reading, or relaxing. Start with 10 minutes a day and, at your own pace, increase your comfort level to 30 minutes each day. **Mini-step B**: Increase duration from 30 to 60 minutes each day at your own pace and comfort level.
Use "Helpful Thoughts about CPAP" and "Relaxation Strategies" while practicing these steps. If you are struggling to achieve this goal, return to Step 1. ↕	
Step 3. The goal is to become comfortable using the CPAP mask and machine during a daytime nap.	Schedule a 30- to 60-minute nap using your CPAP machine. You may nap in a recliner or your bedroom. You may start with shorter naps. Limit this step to a week or less because napping daily for more than a week can affect sleep quality and contribute to difficulty sleeping at night.
Use "Helpful Thoughts about CPAP" and "Relaxation Strategies" while practicing these steps. If you are struggling to achieve this goal, return to Step 2. ↕	
Step 4. The goal is to become comfortable using the CPAP mask and machine during nighttime sleep. Now that you have practiced using CPAP outside the bed and during the day, it is time to start using it at bedtime.	**Mini-step A**: Use the CPAP while falling asleep at the beginning of the night. Work on initially using it for at least one to two hours. It's okay if you pull it off and go back to sleep. **Mini-step B**: Work on using the CPAP for four hours or more every night.
Use "Helpful Thoughts about CPAP" and "Relaxation Strategies" while practicing these steps. If you are struggling to achieve this goal, return to Step 3.	

FEEDBACK

The final product was presented to local knowledge users and leadership for feedback. SC MIRECC's Consumer Advisory Board and Committee for Educational Excellence provided comprehensive review and feedback.

PILOT TESTING

The guide was initially piloted among the patients seen in a psychiatry walk-in clinic by psychiatry residents, nurse practitioners, and physician assistants.

RESULTS

A Good Fit: Making CPAP Work for You is a concise, colour, 5-page, printed front and back guide. This educational product is an easy-to-carry and user-friendly educational

product intended to provide key information about OSA, CPAP, and step-by-step CPAP desensitization and acclimatization for patients having difficulty using CPAP therapy.

This is developed to help veterans with CPAP intolerance due to claustrophobia self-desensitize and acclimatize with CPAP where access to a behavioural health provider is not readily available. This educational product also helps RTs and primary care providers working in community-based outpatient clinics or any VA provider with limited access to Primary Care Mental Health Integration as a clinical tool to provide focused, brief intervention to veterans who report difficulty using CPAP.

The guide provides a general overview of OSA diagnosis, the importance and rationale of CPAP therapy, tips on resolving equipment-related problems with the help of an RT, lifestyle changes, cognitive restructuring tips to improve CPAP use, relaxation exercises and a 4-step approach to CPAP self-desensitization. Finally, a list of important online resources is provided from reputable sources regarding OSA, insomnia, and CPAP.

DISSEMINATION

To date, approximately 700 copies have been disseminated free of charge to outpatient sleep, CPAP, mental health, and primary care clinics across the STVHCS. The guide's PDF version was also available to download from the SC MIRECC website (https://www.mirecc.va.gov/visn16/making-cpap-work-for-you.asp). It was downloaded more than 1100 times from the SC MIRECC website. This product was presented nationally at the American Academy of Sleep Medicine Annual Meeting 2022, the 10th Annual VA Sleep Practitioners Meeting, and locally at the STVHCS research day, sleep medicine and CPAP committee's monthly meetings.

FUTURE PLAN

We plan to obtain formal qualitative and quantitative data on the acceptability and effectiveness of this product in improving CPAP compliance based on downloads from CPAP machines. We will further evaluate the feasibility of incorporating this as a brief, initial nursing intervention tool in primary care for patients who report difficulty using CPAP before initiating behavioural health or sleep medicine referrals.

DISCUSSION

To our knowledge, *A Good Fit: Making CPAP Work for You* is the first respiratory therapist-supported self-directed CPAP desensitization guide. It may be an important clinical tool for RTs to assess and address CPAP intolerance in CPAP clinics by practicing the equipment with relaxation. This can have important implications for VA standard of care services with OSA.

Since 2013, sleep apnea has been the most common service-connected (SC) disability of all respiratory disabilities among veterans. In Fiscal Year 2019, 1.3 million veterans enrolled in the VHA have been diagnosed with sleep apnea, an increase of about 384,000 veterans (44%) from FY 2015. The number of veterans receiving sleep apnea devices and supplies from VHA increased 96% from FY 2014 to FY 2018. VHA spent around $147.6 million in FY 2014 and $233.9 million in FY 2018 on sleep apnea devices and supplies (a 59% increase). The VA Office of Inspector General found that almost half of 250,000 veterans who were issued a PAP device from October 2016 to May 2018) used it less than 50% of the time. The office further determined that 50,900 of almost 114,000 veterans who did not use the sleep apnea devices did not receive the necessary follow-up care due to staffing issues. Office of Inspector General reported that VHA is at risk of potentially spending $261.3 million over the next five years on sleep apnea devices and supplies that veterans will not use if the VHA does not act to change its sleep apnea device issuance practices.[46]

A Good Fit: Making CPAP Work for You is a concise, evidence-informed, user-friendly guide for CPAP self-desensitization that emphasizes the safety and tolerability of CPAP and, thus, motivation to use CPAP safely without the supervision of a trained behavioural provider. Although preliminary, it warrants the need to obtain qualitative and quantitative data on the acceptability and utilization of this product by veterans, their perceived obstacles, and clinical outcomes to update the product in future. In the setting of limited evidence for second-line treatments[6] and limitations of dental services or trained psychologists, this educational product will empower veterans and lead to improved access to care, increase CPAP utilization, improve long-term mortality, and benefit the VA system.

ABBREVIATIONS

CBOC Community-Based Outpatient Clinics
CBT Cognitive Behavioral Therapy
CPAP Continuous Positive Airway Pressure
CPT Cognitive Processing Therapy
DoD Department of Defense
EPAP Expiratory Positive Airway Pressure
FDA Food and Drug Administration
HNS Hypoglossal Nerve Stimulation
ICSD-3 International Classification of Sleep Disorders
IRB Institutional Review Board
MAD Mandibular Advancement Device
ME Motivational Enhancement
NMES Neuromuscular Electrical Stimulation
OAT Oral Appliance Therapy
OIG Office of Inspector General
OSA Obstructive Sleep Apnea
PACT Patient Aligned Care Team
PAP Positive Airway Pressure
PCP Primary Care Provider
PE Prolonged Exposure
PTSD Post Traumatic Stress Disorder
RT Respiratory Therapist
SC MIRECC South Central Mental Illness Research, Education, and Clinical Center

SEOC Standard Episode of Care
STVHCS South Texas Veterans Health Care System
UTHSCSA University of Texas Health Sciences Center
VHA Veterans Health Administration
VA Department of Veterans Affairs

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ABOUT THE AUTHOR

Adeel Meraj, M.D is a psychiatrist at San Antonio VA. He is fellowship trained in sleep medicine and board certified in general psychiatry, sleep medicine, and brain injury medicine. His research objectives are to studying sleep and behavioral disturbances in the veterans with PTSD and TBI.

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CLINICAL TRIAL REGISTRATION

This is not a clinical trial. Not applicable

ETHICAL APPROVAL

The local Institutional Review Board provided an exemption as this is not a research study involving humans.

COMPETING INTERESTS

All authors have completed the ICMJE form and declare no conflict of interest.

INDIVIDUAL AUTHOR CONTRIBUTION STATEMENT

All authors contributed to the study concept and design. Material preparation was performed by AM, LK, and MRB. The first draft of the manuscript was written by AM and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

DATA AVAILABILITY STATEMENT

There is no quantitative data resulting from this project. Any information will be shared prohibiting the recipient from identifying or re-identifying (or taking steps to identify or re-identify) any individual whose data were collected as the patient survey.

AI STATEMENT

The authors confirm no generative AI or AI-assisted technology was used to generate content.

DISCLAIMER

The views expressed herein are solely those of the authors and do not reflect an endorsement by or the official policy or position of the South Texas Veterans Healthcare System, the University of Texas Health Science Center at San Antonio, the Department of Veterans Affairs, or the U.S. government. The information in the guide is designed to provide information to assist decision making. It is not intended to define a standard of care and should not be construed as one. Neither should it be interpreted as prescribing an exclusive course of management. Variations in practice will inevitably and appropriately occur when clinicians consider the needs of individual Veterans, available resources, and limitations unique to an institution or type of practice. Every healthcare professional making use of the guide is responsible for determining the appropriateness of applying them in any given clinical situation. The funding sources had no involvement in the product design, the collection, analysis and interpretation of data, the writing of this manuscript, or the decision to submit this manuscript for publication.

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