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## Sleep Rehabilitation Program for Military Members with TBIs & SCIs

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# Sleep Rehabilitation Program for Military Members with TBIs & SCIs

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## Introduction

The purpose of this capstone project was to make meaningful strides toward enhancing sleep health and holistic well-being in military members with spinal cord and traumatic brain injuries, utilizing an occupational therapy approach.

How?

Through the creation and implementation of a sleep rehabilitation program for military members with TBIs and SCIs that incorporates aerobic exercises and other therapeutic activities to minimize sleep disturbances and enhance the overall quality of rest.



Fig. 1 Sowers, Joseph, *Military Service Branches*, 2016

## Capstone Site Description

### Stay In Step Brain and Spinal Cord Injury Recovery Center

- A long-term, non-profit, neuro-outpatient rehabilitation facility.
- Offers specialized activity-based exercise programs tailored to active-duty service members, veterans, and civilians with various neurological conditions causing paralysis.
- Founded by Army veteran Romulo Camargo and his wife Gabby.
- Situated in Temple Terrace, FL.
- Currently treating 10 veterans with either a SCI or TBI.

## Summary of Needs Assessment

### The occupation-based need to be met for military members:

- Urgent need for assessing and managing untreated sleep disturbances in service members.
- There is a noticeable gap in providing effective assessments and interventions tailored to identify and address sleep disturbances among service members with TBIs and SCIs.
- A need to better promote and educate this population on the use of rehabilitative measure over pharmaceutical.
- Gap in the literature for the influence of aerobic exercise on quality of sleep in rehabilitation programs, and incorporation of partners in treatment for sleep disruption and its outcomes.

### Why it was important for this project to be completed:

- To provide sleep rehabilitation programming for active-duty service members and veterans with TBIs and SCIs, incorporating aerobic exercises and other therapeutic activities.
- To determine if sleep rehabilitation programming reduces sleep disruptions and improves the overall quality of rest.
- To emphasize OTs role in improving quality of rest and sleep through increased independence, participation and performance in everyday occupations and therapeutic exercises.

## Literature Review Summary

- 69% of service members get less than 6 hours of sleep, and majority of wounded or injured during combat service members receive far less than 5 hours per night post-injury (Good et al., 2020).
- TBIs and SCIs impact sleep and rest occupational patterns, this can intensify dysfunctions and affect performance in these other areas of concern such as ADLs, IADLs, social and leisure participation (AJOT, 2019).
- Yet, TBI and SCI interventions rarely include sleep-specific assessments and strategies.
- "In a sample of 114 post-deployment military service members and veterans who had sustained a blast-related mTBI, 77% endorsed experiencing sleep disturbances" (Mckee et al., 2019). These sleep disturbances included:
  - Insomnia (55%)
  - Hypersomnia (85%)
  - Sleep fragmentation (54%)
  - Obstructive sleep apnea syndrome (35%)
- Compared to those without TBI, those with TBI were 41% more likely to develop a sleep disorder (Leng et al., 2021). The sleep disorders found include sleep apnea, insomnia, hypersomnia, and sleep-related movement disorder.
- Similarly, individuals with SCIs commonly experience: sleep-disordered breathing, sleep-related movement disorders, circadian rhythm sleep-wake disorders, an insomnia disorders.
- The current effective treatments found for chronic insomnia in service members is cognitive behavioral therapy (CBT), motivational interviewing, telehealth for sleep recommendations, sleep diaries, and education on sleep hygiene and stimulus control measures.
- However, a very high amount of military personnel use sleep pharmaceuticals instead which can impact performance the next day.
- By increasing daily activity levels using a variety of strategies, even low intensity, such as housekeeping, sit-to-stand repetitions, along with encouraging exercise through web pages, videos, and self-goal setting apps physical activity can effectively and safely improve sleep in both healthy and co-morbid populations with sleep disturbance (Huang et al., 2023).

## Capstone Project Description & Outcomes

Fig. 2 Sleep Prescreening Questionnaire

Fig. 3 Activity Analysis Activity

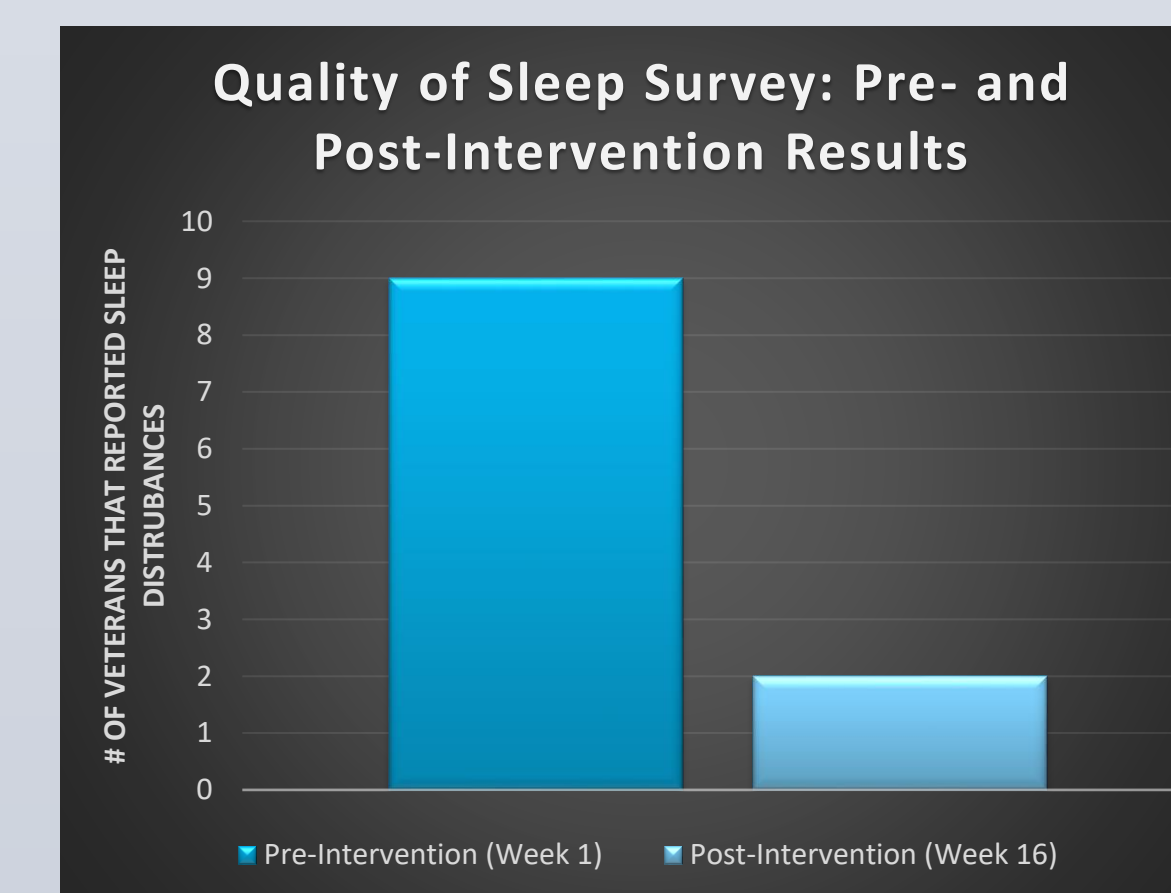


Fig. 4 Sleep Rehabilitation Program Effectiveness



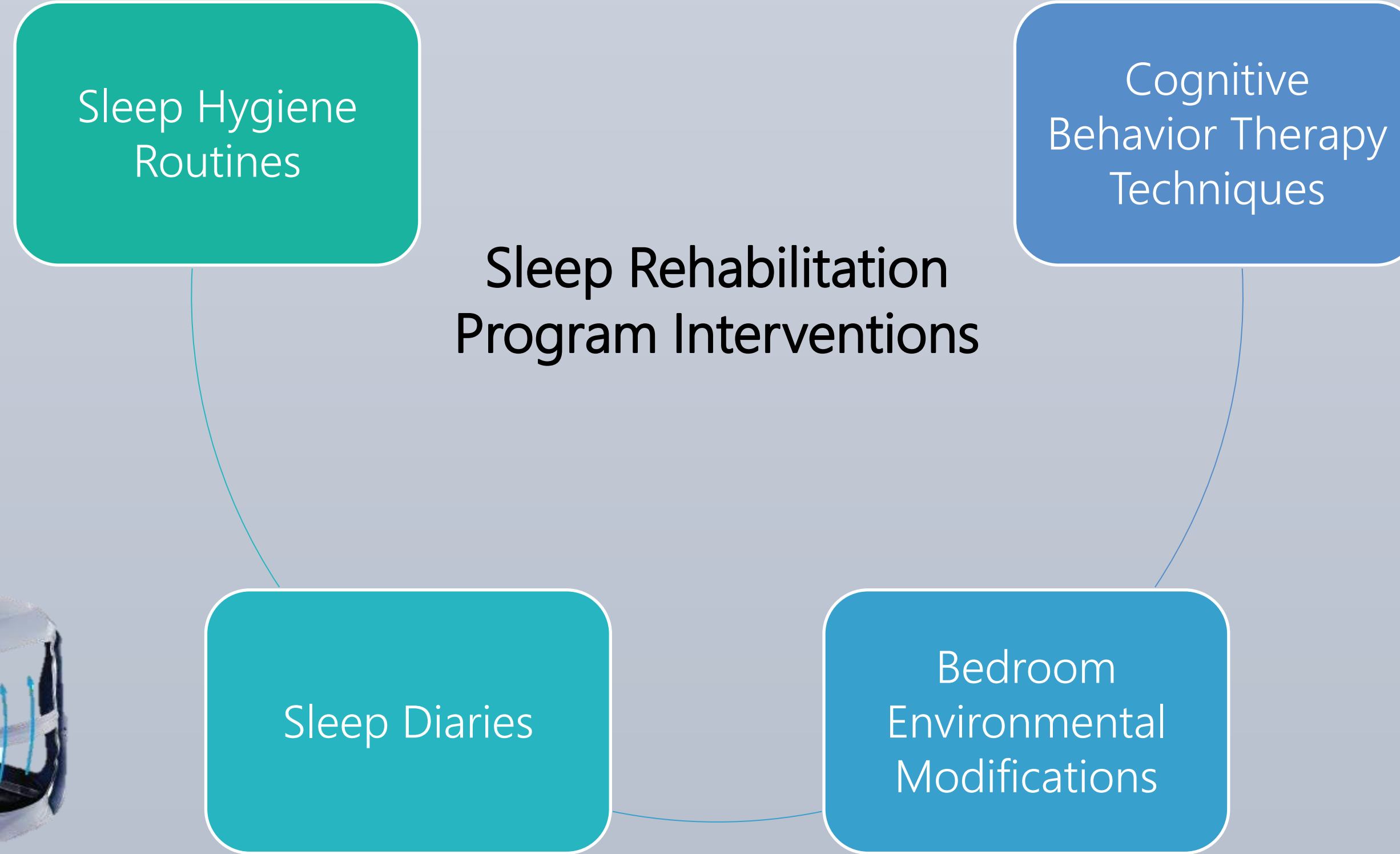
Fig. 5 Kickboxing, Aerobic Exercise



Fig. 6 Alter G, Aerobic Exercise



Fig. 7 Lat Pulldown, Resistance Training



After 16 weeks of fully participating in the program's interventions, results from the pre-post sleep prescreening questionnaire, along with additional data gathered from weekly pre-post intervention surveys, observations of participation in various therapeutic exercises and activities, and patient feedback, indicated that veterans at Stay in Step showed significant improvements in the quality of their rest and sleep.

## Capstone Goals Achieved

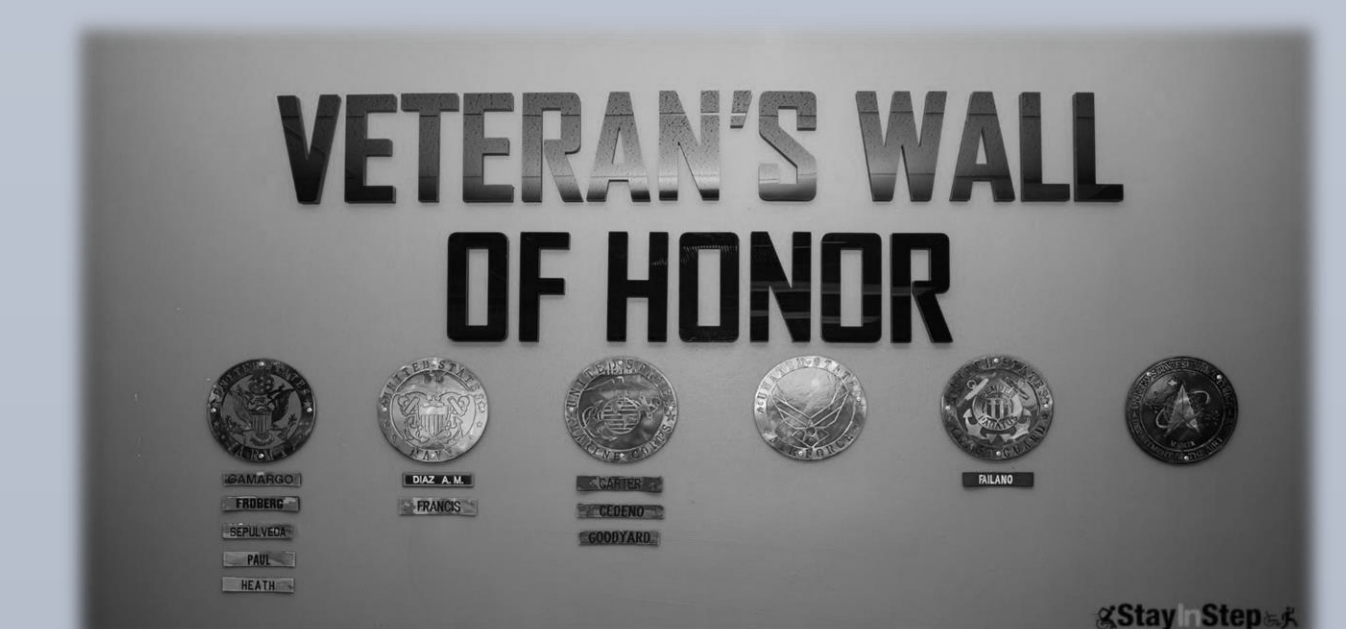
- I elevated my knowledge about sleep rehabilitation programming by reviewing research articles and conducting a small-scale needs assessment involving 8 participants.
- I enhanced my mindfulness and deepened my understanding of the backgrounds of this unique population.
- I implemented a comprehensive program that included purposeful aerobic exercise, resistance training, sleep hygiene routines, environmental modifications to sleeping locations, and cognitive behavioral therapy techniques.

## Implications for OT Practice

- Personalized Care Plans**: Tailored sleep interventions highlight the importance of individualized care plans, improving sleep quality and overall well-being.
- Enhanced Rehabilitation Protocols**: Incorporating aerobic exercises, resistance training, sleep hygiene routines, environmental modifications, and CBT techniques can improve sleep disturbances in patients with TBIs and SCIs.
- Holistic Approaches to Sleep Management**: Success with non-pharmaceutical methods like aerobic exercises and environmental modifications emphasizes holistic care. Educating patients on alternatives to long-term medication use can promote sustainable sleep health and reduce pharmaceutical dependency.
- Patient Engagement and Therapeutic**: Collaboration with staff to expand knowledge and adapt interventions shows the value of teamwork in comprehensive care.
- Interdisciplinary Collaboration**: Building rapport and trust with patients enhances therapeutic relationships and clinical outcomes.

## References & Acknowledgement

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References Available Upon Request