What occupation-based interventions improve quality of sleep in adults with acquired brain injury (ABI) experiencing sleep disturbances?

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Objectives

At the conclusion of this presentation participants will be able to:

- Comprehend the prevalence of sleep disturbance after experiencing an ABI.
- Identify treatments occupational therapy (OT) practitioners can utilize in practice to improve sleep in individuals with ABI.

Background

What defines ABI?

- Damage to the brain that is not hereditary, congenital, degenerative, or caused by distress during birth (Chan, Zagorski, Parsons, & Colantonio, 2013)
- Damage causes changes in neuronal activity that can disrupt physical integrity, metabolic activity, nerve cell functioning, and functional participation in daily activities (Chan, Zagorski, Parsons, & Colantonio, 2013).

Prevalent Statistics

- ABIs are one of the primary causes of mortality and disability globally (Brain Injury Alliance, 2021)
- Poor sleep impairs cognitive performance (attention, working memory, decision making abilities), lowers emotional intelligence (increases irritability, aggressiveness, inability to handle stressful situations) and decreases health, leading to a poor quality of life (Theadom et al., 2018)
- Evidence-based research concludes that 41% of individuals with ABI experience sleep issues one year following the trauma (Theadom et al., 2018)
- Addressing poor sleep quality can reduce pain, cognitive deficits, fatigue, inability to participate in rehabilitation, work inefficiency, poor functional performance, and inpatient admissions (Theadom et al., 2018)

Relationship to Occupational Therapy

- Occupational therapy practitioners work to improve participation and performance in daily life roles.
- Adults living with ABI are more likely to require interventions to assist with participation and functional performance of daily occupations (ADLs, IADLs, health management, education, work, play, leisure, social participation, and most importantly, rest and sleep (American Occupational Therapy Association [AOTA], 2014).

Purpose

This systematic review identifies and evaluates interventions with outcome measures related to improving sleep for participants with ABIs within the scope of OT practice.

Methods

Main Search Terms

Population
- ABI
- Non traumatic brain injury
- Traumatic brain injury

Intervention
- Behavioral/Cognitive
- Educational
- Movement-based
- Environmental/Sensory

Outcome
- Sleep disturbance
- Sleep efficacy
- Quality of life

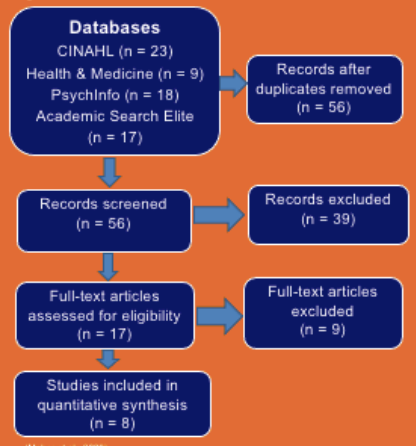
Inclusion Criteria

- ≥ 18 years of age
- ABI diagnosis (mild, moderate, or severe)

Exclusion Criteria

- Inability to provide informed consent
- Engagement in excessive alcohol or drug use
- Participants currently receiving treated for sleep disturbances
- Medically unstable disorder that may interfere with results (i.e., cancer or severe psychosis)

Figure 1: Prisma Flow Chart



(Moher et al., 2009)

Limitations of Presented Studies

- Small sample sizes
- Moderately high attrition rates due to physical or cognitive reasons
- Limited number of studies

Results

Intervention	Clinical Relevance, *(Statistical Significance)*	Study
CogSMART	▪ Reductions in sleep disturbances, *(p =.01)*	Twamley et al., 2014
Adapted Cognitive Behavioral Therapy (CBT)	▪ Improvements in quality of sleep, *(p = .05)* ▪ Reductions in insomnia, *(p = .01)*	Nguyen et al., 2017
Online CBT	▪ Improvements in quality of sleep, *(p = .04)* ▪ No improvements in onset of sleep, *(p =.35)* ▪ Both treatments feasible for practice	Theadom et al., 2017
Light Therapy	▪ Reduction in daytime sleepiness, *(p = .01)* ▪ Reductions in fatigue, *(p = .01)*	Sinclair et al., 2014
Sleep Hygiene Protocol	▪ Reductions in periods of wakefulness after sleep, *(p = .048)* ▪ Improvements in total sleep time and sleep efficiency	Makley et al., 2020
Sleep Hygiene	▪ Direct patient care (DPCA) during sleep hours reduces sleep duration, *(p = .035)* ▪ DPCA during sleep hours reduces sleep efficiency, *(p = .001)* ▪ DPCA during sleep hours increases periods of wakefulness after sleep onset, *(p = .028)* ▪ Light exposure during sleep hours increases periods of wakefulness after sleep onset, *(p = .004)*	Amato & Anthony, 2020
Group Yoga and Seated Rest	▪ Reductions in periods of wakefulness after sleep onset with seated rest, *(p = .006)* ▪ No significant reductions in periods of wakefulness with sleep onset with yoga, *(p = .427)* ▪ Both feasible for practice	Krese et al., 2020
Mindfulness-Based Stress Reduction	▪ No significant improvements in sleep disturbances, *(p = .07)* ▪ Reports of positive experiences	Azulay, Smart, Mott, & Cicerone, 2013

Discussion

- CogSMART, Adapted CBT, and Online CBT interventions presented the strongest supporting evidence through reductions in sleep disturbances, improvements in quality of sleep, reductions in insomnia, and feasibility (Nguyen et al., 2017; Theadom et al., 2017 Twamley et al., 2014).
- Evidence for cognitive behavioral therapy with educational training optimizes routines for healthy sleep patterns and promotes community integration (Twamley et al., 2014).
- Patients reported reductions in daytime sleepiness and reductions in fatigue with light therapy (Sinclair et al., 2014).
- Sleep Hygiene interventions revealed the importance of sleep hygiene strategies has on reducing periods of wakefulness after sleep and improving sleep efficacy (Amato & Anthony, 2020; Makley et al., 2020).
- Seated Rest is beneficial for reducing periods of wakefulness (Krese et al., 2020).

Clinical Implications

- Results can assist OT practitioners in assessing sleep and its impact on occupational performance and satisfaction among adults with ABI and other populations (Tester & Foss, 2017).
- Results guide OT practitioners to administer appropriate therapeutic approaches highlighting compensatory approaches, habit and routine adjustments, training in prospective memory, attention, executive training, and behavioral control techniques (Twamley et al., 2014).

Future Research

- Future research with larger clinical trials is highly recommended for expanding on evidence-based practice for promoting quality of sleep among persons with ABI.
- CBT and educational training may be effectively integrated into community programs for people with ABI, as the results also supported community integration.

Conclusion

The review provides OT practitioners with evidence-based research for assisting clinical practice in choosing an appropriate treatment for adults living with ABI experiencing dysfunction in daily occupations due to sleep disturbances.

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