Sleep Psychology: Cognitive Behavioral Therapy for Insomnia and CPAP Adherence

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1. Describe the role of behavioral interventions in the treatment of sleep disorders.

2. Summarize the primary aspects of Cognitive Behavioral Therapy for Insomnia

3. Describe current behavioral interventions for increasing CPAP adherence
The Role of Sleep Psychologists

- Insomnia Disorder
- Sleep Apnea - CPAP use
- Circadian Rhythm Disorders
- Nightmares
- Adjustment to other Sleep Disorders (e.g., Narcolepsy)
Acknowledgements

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Edward Haraburda, PhD
Christi Ulmer, PhD

VA CBT for Insomnia Training Program
What is insomnia disorder?

- Difficulty initiating sleep, difficulty maintaining sleep, or waking up too early
  - One or more is present at least 3 times a week, for at least 3 months
- Poor sleep occurs despite adequate opportunity and circumstances for sleep
- Poor sleep is associated with daytime impairment and distress
Insomnia is frequently co-morbid with other psychiatric disorders

- Within VA, common co-morbid psychiatric conditions are PTSD, depression, and anxiety disorders
- Having another psychiatric disorder does not preclude diagnosis and treatment of insomnia disorder

Co-morbid insomnia often persistent

- Unlike poor sleep, insomnia disorder does not spontaneously resolve even with successful treatment of a comorbid condition
CBT-I is Effective

• Is effective among Veterans (and the general population)
  • Improves sleep initiation
  • Reduces time awake in the middle of the night

• Recommended as a first line treatment of insomnia
  • Practice parameters published by the American Academy of Sleep Medicine
  • NIMH state of the science consensus statement
Comparative Efficacy: CBT-I for Sleep Onset Difficulties
(Jacobs et al., 2004)

VA CBT for Insomnia Training Program
Comparative Efficacy: CBT-I for Sleep Maintenance Difficulties

Minutes awake after sleep onset

- Baseline
- Post-Treatment
- 3 Months Follow-up
- 12 Months Follow-up
- 24 months Follow-up

CBTI (18)
Temazepam (20)
Combined (20)
Placebo (20)

Adapted from Morin et al., JAMA 1999
Outcomes from the VA CBT-I Training Program

Karlin et al. 2013 JCCP

182 patients (training cases) in first 3 training cohorts

Graph:
- ISI score
- BDI-II score

ISI: Effect Size = 2.2
BDI-II: Effect Size = 0.6

Pre post
What is CBT-I?

• Comprehensive approach targeting factors that maintain insomnia
• Rooted in the science of sleep/wake regulation and principles of behavior change
• Skills-based & brief (approximately 6 sessions)
• Both individual and group formats are effective
A MODEL OF CHRONIC INSOMNIA

Predisposing Factors
- Biologic traits
- Psychological traits
- Social factors

Precipitating Factors
- Medical illness
- Psychiatric illness
- Stressful life events

Perpetuating Factors
- Excessive time in bed
- Napping
- Conditioning


Conditioned Arousal

• Mostly deal with Classical Conditioning.
  • We want Bed = Sleep
  • We don’t want Bed = Tossing and Turning, Thinking, Reading, Watching TV, Playing/Talking/Texting on the Phone, Sleep Effort, Worry about life or sleep

• So we use Stimulus Control:
  • Don’t do anything in bed except sleep and sex
  • Only go to bed when sleepy (difference between tired and sleepy)
  • Only sleep in bed, not on couch, chair, etc.
  • When do we tell people to get out of bed?
  • What if they wake up in the middle of the night? In the morning?

• Sleep routines: not necessarily a good thing
What keeps insomnia going? The 3rd of the 3P model

- Avoidance/Naps (which then impacts Sleep Drive and Circadian Rhythm)
- Excessive Time in Bed
- Irregular sleep schedule
- Conditioned Arousal
  - Physical Arousal
  - Cognitive Arousal
Sleep Restriction/Sleep Efficiency Training

• Used to build the body’s Sleep Drive
• Consolidates sleep
• Want to increase sleep efficiency: amount of time asleep/amount of time in bed (TST/TIB * 100)
• Sleep diaries are very important
• Sleep efficiency < 80%, restrict TIB to TST (go from desired wake time), but not under 5 hours
• Sleep efficiency 80-85% leave TIB as is (rare at first for someone with insomnia)
• 85% or more add 15 minutes to sleep prescription
How It Works

Step 1: Reduce TIB

Step 2: Expand TIB when indicated
Physical Arousal

• Sleep hygiene:
  • control caffeine, nicotine, alcohol intake
  • Exercise, but not within 3-4 hours of sleep
  • Take a nice warm bath/shower 1-2 hours before bed (not within an hour of bed)
  • Comfy room temperature (usually not above 75F)
  • Keep the room quiet and dark
  • When and what to eat, drink

• Relaxation Techniques: more on these next
Relaxation

• Diaphragmatic Breathing/Slow Breathing

• Progressive Muscle Relaxation (PMR)
  • Teach patients to tighten and release specific muscle groups

• Body Scan- paying attention to each part of one’s body from head to toe, investigating what it feels like, and allowing it to relax (different from mindfulness body scan)

• Guided Imagery- Listening to a script. Imagining going to... the beach, the forest, down a country road, the mountains, etc.
Relaxation, cont’d

• Hypnosis/autogenic relaxation

• Stretching/Gentle Yoga

• Meditation (many many different types):
  • Loving-kindness (Meta)
  • Religious, which may include Contemplative Prayer
  • Mantra
  • Concentration on something (Breath, candle flame, etc.)
  • Mindfulness (not necessarily relaxing, but helpful in allowing what is to be. Decreases sleep effort.)
Cognitive Arousal

- Develop a “buffer zone”
- Set a “worry time” and use a constructive worry worksheet

<table>
<thead>
<tr>
<th>CONCERNS</th>
<th>SOLUTIONS</th>
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<td>1.</td>
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<td>3.</td>
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</table>
More Cognitive Arousal

- Can use traditional CBT approaches, including **Thought Records**

<table>
<thead>
<tr>
<th>Where were you?</th>
<th>Emotion or feeling</th>
<th>Negative automatic thought</th>
<th>Evidence that supports the thought</th>
<th>Evidence that does not support the thought</th>
<th>Alternative thought</th>
<th>Emotion or feeling</th>
</tr>
</thead>
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## Components of CBT-I

<table>
<thead>
<tr>
<th>Technique</th>
<th>Aims</th>
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<tbody>
<tr>
<td><strong>Stimulus Control</strong></td>
<td>Strengthen bed and bedroom as sleep cues</td>
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<tr>
<td><strong>Sleep Restriction</strong></td>
<td>Restrict time in bed to increase sleep drive and consolidate sleep</td>
</tr>
<tr>
<td><strong>Relaxation, buffer, worry time</strong></td>
<td>Arousal reduction</td>
</tr>
<tr>
<td><strong>Sleep Hygiene</strong></td>
<td>Address substances, exercise, eating, environment</td>
</tr>
<tr>
<td><strong>Cognitive Restructuring</strong></td>
<td>Address thoughts and beliefs that interfere with sleep &amp; adherence</td>
</tr>
<tr>
<td><strong>Circadian Rhythm Entrainment</strong></td>
<td>Shift or strengthen the circadian sleep/wake rhythm</td>
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Order of CBT-I

• While there is a general structure, the exact order that components are implemented will depend on what is maintaining the individual patient’s insomnia.
## How does Sleep Hygiene differ from CBT-I?

<table>
<thead>
<tr>
<th>Sleep Hygiene Education</th>
<th>CBT-I</th>
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<tbody>
<tr>
<td>• Avoid stimulants for several hours before bedtime.</td>
<td>• Sleep Restriction</td>
</tr>
<tr>
<td>• Avoid alcohol around bedtime.</td>
<td>• Stimulus Control</td>
</tr>
<tr>
<td>• Exercise regularly.</td>
<td>• Relaxation Training</td>
</tr>
<tr>
<td>• Allow at least a 1-hour period to unwind before bedtime.</td>
<td>• Cognitive Therapy</td>
</tr>
<tr>
<td>• Keep the bedroom environment quiet, dark and comfortable.</td>
<td>• Sleep Hygiene Education (except for regular bedtime)</td>
</tr>
<tr>
<td>• Maintain a regular sleep schedule.</td>
<td>• Cognitive Therapy</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Standard Guidelines</th>
<th>Individualized Multi-Component Intervention</th>
</tr>
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<tbody>
<tr>
<td>Helps Normal Sleepers Maintain Sleep Health</td>
<td>Treatment for Insomnia Disorder</td>
</tr>
<tr>
<td>Preventive</td>
<td>Curative</td>
</tr>
<tr>
<td>The Dental Hygienist</td>
<td>The Dentist</td>
</tr>
<tr>
<td>Minimal Impact on Insomnia Disorder</td>
<td>Very Effective Insomnia Disorder Treatment</td>
</tr>
<tr>
<td>Inactive Condition in Insomnia Research</td>
<td>Active Condition in Insomnia Research</td>
</tr>
</tbody>
</table>
Advantages of CBT-I

- No risk of drug interactions
- Minimizes risk for wakening up feeling confused and disoriented
- Benefits continue (and often increase) even after treatment is discontinued
- Brevity and effectiveness of approach
- Involves behavioral changes that improve quality of life in general such as winding down before bed
- Patients feel empowered by not relying on medication to sleep (increased self-efficacy)
“But I don’t want to”

Cost/Benefit Analysis- Reasons to and not to make the changes we are discussing. Look at what is most important to the patient.
How do I know if a patient is a good candidate for CBT-I treatment?

Experienced CBT-I providers can tailor CBT-I for Patients with varied presentations, including those involving comorbidities.

There is empirical support for CBT-I for the treatment of those with insomnia comorbid with

- A history of alcohol and drug abuse (but are not currently abusing)
- Psychiatric conditions; such as PTSD, depression, anxiety disorders, and even thought disorders
- Chronic pain conditions
- Other sleep disorders, such as sleep apnea

CBT-I is NOT indicated when the Patient

- Does not meet criteria for insomnia disorder
- Is engaged in exposure therapy for PTSD
- Is working night or rotating shifts
- Has seizure or uncontrolled bipolar disorder
- Has untreated other sleep disorders/excessive daytime sleepiness
Resources

• Mobile App: CBT-I Coach
  • A CBT-I treatment companion
    • Anyone can download free app to his/her smart phone and can use the app during CBT-I treatment

• Better Path to Sleep:
  https://www.veterantraining.va.gov/insomnia/
PAP Adherence: Behavioral Interventions
PAP Non-Adherence

PAP non-adherence continues to be a prevalent concern

• Estimates of PAP non-adherence vary
  • Non-adherence: less than 4 hours of use per night
  • Estimates 30 to 83% ¹, ², ⁴
  • Numbers based on those enrolled in research studies

Many studies have been conducted to identify factors that influence or predict PAP adherence ³, ⁵

• No single factor alone predicts adherence or non-adherence
• Behavioral determinants explain up to approximately 20% of the total variance in CPAP adherence ⁵
Biopsychosocial Model of PAP Adherence

• Interactions between biological, psychological, and social factors influence both the development and outcome of chronic disease

• Crawford et al. (2014): PAP Adherence is influenced by an interaction of
  • Biomedical factors
  • Psychological factors
  • Social factors
## Factors that Impact Adherence

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<thead>
<tr>
<th>Biomedical</th>
<th>Psychological</th>
<th>Social</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td>Beliefs about OSA/CPAP</td>
<td>Social pressure vs support</td>
</tr>
<tr>
<td>OSA Severity</td>
<td>Self-Efficacy</td>
<td>Family Attitudes</td>
</tr>
<tr>
<td>Symptom Severity</td>
<td>Motivation; readiness to change</td>
<td>Socio-economic factors</td>
</tr>
<tr>
<td>Side-effects during the first two weeks</td>
<td>Coping Style</td>
<td>Partner quality of sleep</td>
</tr>
<tr>
<td>Mask interface</td>
<td>Low mood/Depression</td>
<td>Bed Partner</td>
</tr>
<tr>
<td>Small nasal volume and high nasal resistance</td>
<td>Anxiety/Claustrophobia</td>
<td>Consistent/safe sleep environment</td>
</tr>
<tr>
<td>Other sleep disorders</td>
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Interventions to Promote PAP Adherence

Biomedical
• Mask interface, humidification
• hypnotics

Psychological and Social
• Motivational Interviewing
• Cognitive Behavioral Therapy
• Graded Exposure Therapy/Systematic Desensitization
Motivational Interviewing

• Originally developed for treating addictive behaviors

• A type of talk therapy focused on helping a patient resolve ambivalence to change

• Effective when motivation is the primary factor impacting adherence or when patients need support with habit change
Motivational Interviewing (MI)

CPAP use requires a significant lifestyle change

Behavioral change occurs in stages:
- Pre-contemplation
- Contemplation (getting ready)
- Preparation (ready)
- Action
- Maintenance
Motivational Enhancement Therapy (MET)

• Initially developed by Aloia et al. (2001)
  • Collaborative approach (rather than educational)
  • Evaluates readiness, confidence, and motivation to use PAP
  • Explores ambivalence regarding PAP
  • Identifies discrepancies between values and behavior
  • Explores impact of OSA on health
  • Reinforces self-efficacy
Cognitive Behavioral Therapy (CBT)

- Maladaptive Thoughts and/or Behavior
- CBT involves:
  - Psychoeducation
  - Identifying and addressing maladaptive thoughts (beliefs, expectations)
  - Self-monitoring of behavior
    - Helping patients recognize unhelpful/helpful behavior and create habit change
  - Identifying and addressing social factors to adherence
  - Relaxation training
Thoughts
“I will never get used to CPAP”

Behavior
Takes CPAP off

Emotions
Frustration, Anxiety, Sadness

Physical Response
Tension, breathing rate
Systematic Desensitization

• Anxiety/panic reaction; Claustrophobia

• Treatment commonly used for other anxiety disorders and phobias

• Involves:
  • Exposing the patient to the feared object (CPAP) in a systematic and safe way

• Relaxation training
Systematic Desensitization

- Two-factor theory of Avoidance Learning:
  - Phobias are initially acquired by classical conditioning
    - Paired association between a neutral stimulus (CPAP) and feared stimulus
  - Maintained by operant conditioning
    - Avoidance of CPAP = Decrease/no in anxiety
    - This is very reinforcing
Anxiety Level

Avoidance reinforces anxiety

Increased Anxiety

Short-term relief

Graded exposure extinguishes anxiety

Anxiety Level

Long-term decrease in Anxiety
Systematic Desensitization

- Uses a stepped approach
  - From least anxiety provoking to most anxiety provoking

- Breaks the link between anxiety (triggered by CPAP) and the avoidance response
Behavioral Approaches for CPAP Adherence

Most research has been done on ME and CBT.\(^5\)

Bakker et al. (2016)
- RCT comparing CPAP alone and CPAP + ME
- 83 patients with moderate to severe OSA
- ME improved adherence by 99 minutes per night after 12 months

Richards et al. (2007)
- RCT comparing mask fitting/information and mask fitting with CBT group
- 96 men with moderate to severe OSA
- Mean use was greater for the CBT group (5.38 hrs vs. 2.51 hrs) at 6 months
Behavioral Approaches for CPAP Adherence

• Meta-analysis (Wozniac et. al., 2014)
  • Behavioral therapy increased CPAP use by 1.44 hours/night compared to usual care
  • Participants who used their machine increased from 28% to 47%
• MI, CBT, and Systematic Desensitization are all well established evidenced-based psychological treatments
• Further research, including large scale RCTs, as are needed to establish clinical guidelines for their use with PAP adherence
Questions?