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Cognitive Behavioral Therapy for Insomnia (CBT-I)

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Learning Goals

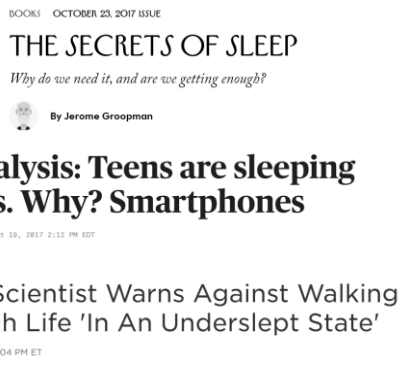
1. Identify the relationship between sleep and health
2. Recognize the symptoms of insomnia disorder
3. Describe research on the effectiveness of CBT-I as a treatment for insomnia
4. Describe how to apply CBT-I with patients who have insomnia disorder

Sleep and Health

- It is well documented and understood that adequate sleep is important for good overall health and quality and quantity of life
- The way we feel while we're awake depends in part on what happens while we sleep. During sleep, the body is working to support healthy brain function and maintain your physical health
- On average, adults should optimally receive between seven and nine hours of sleep each night, but those needs vary individually

Sleep and Health

- Recently, popular media has become interested in sleep



Sleep and Health

- The 2017 Nobel Prize in Physiology or Medicine went to three American scientists for their discoveries of molecular mechanisms controlling the circadian rhythm — the internal clock that regulates sleep patterns and helps people adapt to day and night cycles
- What happens when we sleep?
- It may seem obvious that sleep is beneficial. We all know that going without sleep for too long makes us feel terrible, and that getting a good night's sleep can make us feel ready and confident to take on our day and all of our responsibilities
- Scientists aren't exactly in agreement as to the exact reason why we sleep, but they have discovered that sleep plays a critical role in immune function, metabolism, memory, learning, and other vital cognitive and physiological functions
- Sleep and healthy brain function and emotional well-being
  - Sleep helps the brain work properly; during sleep, the brain is forming new pathways to help it learn and remember information

Sleep and Health

- A good night's sleep has been found to improve learning; it helps enhance your short- and long-term memory and problem solving skills
- Sleep helps you increase your ability to pay attention, use higher order cognitive abilities, and be creative

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Psychol Bull. 2016 September ; 142(9): 969–990. doi:10.1037/bul0000053.

SLEEP AND MENTAL DISORDERS: A META-ANALYSIS OF POLYSOMNOGRAPHIC RESEARCH

Chiara Baglioni[1,*], **Svetoslava Nanovska**[1], **Wolfram Regen**[1], **Kai Spiegelhalder**[1], **Bernd Feige**[1], **Christoph Nissen**[1], **Charles F. Reynolds III**[2], and **Dieter Riemann**[1]

[1]Department of Clinical Psychology and Psychophysiology, Center for Mental Disorders, University of Freiburg Medical Center, Germany

[2]Western Psychiatric Institute and Clinic, University of Pittsburgh, USA

- The authors analyzed data from 91 studies that included 114 relationships
  - Most were on affective disorder (n = 55) and major depression (n = 50)

Total number of individuals or observations in the sample (n =)

SLEEP AND MENTAL DISORDERS: A META-ANALYSIS OF POLYSOMNOGRAPHIC RESEARCH

- Anxiety disorders (n = 21)
  - Mostly PTSD (n = 13)
- Eating disorders (n = 5; all AN)
- Externalizing disorders (n = 7)
  - ADHD (n = 6)
- Developmental disorders (n = 7)
  - Autistic disorder (n = 6)
- Personality disorders (n = 6)
  - Borderline PD (n = 5)
- Schizophrenia (n = 10)

- Results:
  - Sleep continuity (less sleep efficiency, longer sleep onset, more awakenings) was present in all disorders other than affective disorders, panic, and ADHD

SLEEP AND MENTAL DISORDERS: A META-ANALYSIS OF POLYSOMNOGRAPHIC RESEARCH

  - Sleep depth (longer duration of stage I sleep, shorter duration of stage two sleep and slow wave sleep) was worsened among those with affective, anxious, and schizophrenic disorders
  - REM pressure (longer REM latency, decreased REM density, shorter duration of REM sleep) was worsened among those with affective, anxious, and autistic disorders
- Sleep and healthy brain function and emotional well-being
  - Sleep deficiency has been found to alter brain activity; poor sleep can lead to:
    - Indecisiveness; impaired decision making; decreased motivation
    - Poor emotion regulation; agitation; irritability; depressed mood; increased suicide risk
    - Decreased distress tolerance threshold
    - Increased risk-taking behaviors
    - Decreased memory recall

Sleep and Health

- Sleep and physical health
  - During sleep, physical restoration happens. Your blood pressure drops and your breathing becomes deeper and slower
  - Your brain is resting with very little activity, so the blood supply to your muscles increases, delivering extra amounts of oxygen and nutrients that facilitate healing and growth
    - Muscle and tissues are rejuvenated and new cells are regenerated
  - Sleep helps maintain a healthy balance of hormones that make people feel hungry or full; this is why people feel hungrier when sleep-deprived
  - Sleep affects how the body reacts to insulin (controls blood glucose levels)
  - Sleep supports healthy growth and development in children and teenagers
  - The immune system relies on sleep to stay healthy and function appropriately

Sleep and Health

  - Sleep deficiency is associated with increased risk for:
    - Heart and kidney disease
    - High blood pressure
    - Diabetes
    - Stroke
    - Obesity and other illnesses
- Sleep and daytime performance and safety
  - Getting quality sleep at the right time helps people function during the day
  - People who are sleep deficient are less productive at work and school
    - They take longer to finish tasks, have a slower reaction time, and make more mistakes
  - After several nights of losing sleep (even if just 1-2 hours of loss), the ability to function suffers similar to if no sleep occurred at all for a day or two
  - Lack of sleep can lead to microsleep

Sleep and Health

- Even with limited or poor sleep, people often think they can function well
  - Drowsy driving decreases driving ability as much as drunk driving
  - Driver sleepiness leads to 1,500 motor vehicle deaths per year
- Sleep deficiency is not only harmful to the individual, but also to others
- Sleep deficiency has been found to play a role in large-scale human errors such as nuclear reactor meltdowns, grounding of large ships, and aviation accidents

THEORETICAL ISSUES IN ERGONOMICS SCIENCE, 2016
VOL. 17, NOS. 5–6, 533–553
http://dx.doi.org/10.1080/1463922X.2016.1155239

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Predicting drowsiness-related driving events: a review of recent research methods and future opportunities

Michael G. Lenné[a,b] and Emily E. Jacobs[a]

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- The authors reviewed 19 studies
  - 13 that used driving simulators and 6 on-road studies
- Drowsiness was assessed using subjective (e.g., questionnaire measures) and physiological (e.g., EEG activity and eye blink/closure duration)
- Fatigue was linked to:
  - Lane departures
  - Lane movement toward the median line and steering variability

Predicting drowsiness-related driving events: a review of recent research methods and future opportunities

- When on-road tests were done at night and after the participant was sleep deprived, in 38% of tests the examiner had to hit a brake on their side to avoid a crash, and 44% of the driving sessions were ended early due to safety concerns

BIOLOGICAL RHYTHM RESEARCH
2020, VOL. 51, NO. 7, 1133–1154
https://doi.org/10.1080/09291016.2019.1581481

ARTICLE

"Flying on empty" – effects of sleep deprivation on pilot performance

Anna Donnla O'Hagan[a], Johann Issartel[a], Aidan Wall[a], Friedrich Dunne[b], Patrick Boylan[c], Jaap Groeneweg[e], Matthew Herring[d], Mark Campbell[d] and Giles Warrington[d]

- Commercial pilots have demanding and stressful work routines
  - Frequent cross-country and international travel can result in daily changes in sleep routines
  - Sleep time might be often spent in an unfamiliar location (e.g., hotels)
  - On long-haul flights, sleep might be possible but might occur in small, cramped sleeping spaces

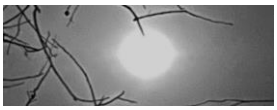
"Flying on empty" – effects of sleep deprivation on pilot performance

- Participants were seven pilots
  - Five men, two women
  - Average age was 35, average of 4950 hours of flying experience
  - Participants reported an average of eight hours sleep time each night in the three nights before baseline assessment
- Participants made three visits:
  1. Familiarized with equipment
  2. Baseline testing and testing after 12 hours awake
  3. Testing after 12-24 hours awake, (one cup of coffee allowed at the beginning)
- Participants completed
  - Profile of mood states – 30 (tension, depression, anger, vigor, fatigue, confusion)
  - Samn-Perelli Crew Status Check (fatigue)
  - Psychomotor vigilance task (10 minute motor attention task)

"Flying on empty" – effects of sleep deprivation on pilot performance

  - Dual-n-back test (detection of auditory and visual stimuli with distractors)
  - Rapid visual information processing task (sustained attention task)
  - Math calculations (aviation-relevant math)
  - Flight performance in a simulator (started in flight, maintain a holding pattern over an airport, follow traffic control commands, perform fuel calculation, respond to mid-flight situational awareness questions)
- Results
  - Increases in confusion and fatigue, decrease in vigor, over time awake
  - Worse performance on the cognitive tests at 21 hours awake
  - Flight performance fluctuated, but generally declined
  - Time to complete math operations increased from 90 to 150 seconds, correct responses decreased from 5.25 at baseline to 4.25 at 24 hours awake, mid-flight fuel calculation time increased from about 110 seconds at baseline to about 190 seconds at 24 hours awake

"Flying on empty" – effects of sleep deprivation on pilot performance



- Deviation from specified speed increased
- Composite flight performance did not significantly decline, but participants had a bounce back at 24 hours (it had been declining steadily before that)

- Overall, sleeplessness resulted in problems for the pilots and worse/longer performance

THE SURGEON 18 (2020) 375–384

A systematic review of sleep deprivation and technical skill in surgery

Dale F. Whelehan [a,b,*], *Cathleen A. McCarrick* [a,b], *Paul F. Ridgway* [a,b]

[a] *Department of Surgery, School of Medicine, Trinity College Dublin, The University of Dublin, Dublin, Ireland*
[b] *Department of Surgery, Tallaght University Hospital, Dublin, Ireland*

- Data from 36 studies were analyzed, which used simulations to examine performance
  - 880 surgeons total were studied, at various training levels
- Sleep deprivation resulted in 12%-32% reductions in performance
  - The impact of sleep deprivation was worse for interns and residents than attendings (upon whom it had no impact)

International Emergency Nursing 25 (2016) 48–52

Contents lists available at ScienceDirect

International Emergency Nursing

journal homepage: www.elsevier.com/locate/aaen

Sleep quality, but not quantity, is associated with self-perceived minor error rates among emergency department nurses

Amy L. Weaver MSHA, BSN, RN, CEN (Charge Nurse) [a,*], Sonja E. Stutzman PhD (Clinical Research Manager) [b], Charlene Supnet PhD (Scientific Writer) [b], DaiWai M. Olson PhD, RN (Associate Professor and Staff Nurse) [b]

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[b] The University of Texas Southwestern Medical Center, 5323 Harry Hines Boulevard, Dallas, TX 75390, United States

Sleep quality, but not quantity, is associated with self-perceived minor error rates among emergency department nurses

- Data were collected from 30 nurses at a 460-bed university hospital
- Sleep quality was assessed using a movement-measuring device and self-report of sleep quality
- Errors (self-reported) were defined as:
  - Minor: does not reach patient, e.g., picking the wrong patient in the EMR
  - Moderate: reaches patient but no harm, e.g., going into the wrong room
  - Major: reaches patient and causes harm, e.g., giving wrong medication
- Results:
  - Total sleep hours were not linked to errors
  - Lower perceived quality of sleep was linked with more minor errors
    - There were very few moderate or major errors in total

Identifying Sleep-Related Concerns in Patients

- Do you ask your patients about their sleep? Sleep concerns tend to be relevant in myriad medical and mental health conditions
  - Heartburn, diabetes, heart failure, musculoskeletal disorders, kidney disease, nocturia, thyroid disease, breathing problems, medications, anxiety, PTSD, depression, bipolar disorder, dementia, epilepsy, headaches, chronic pain, and others
- Unless sleep is the primary presenting concern, clinicians often miss asking about patients' experiences with sleep
  - By being more aware of the sleep patterns of patients, clinicians could help better improve the health and well-being of their patients
- Further, as a clinician, it is pivotal to be able to adequately distinguish between sleep disturbances that are attributable to another health condition versus insomnia disorder, as treatment planning will differ

Insomnia Disorder

DSM-5 criteria (780.52, ICD G47.00):

- The predominant complaint of dissatisfaction with sleep quantity or quality is associated with one or more of:
  1. Difficulty initiating sleep
  2. Difficulty maintaining sleep, characterized by frequent awakenings or problems returning to sleep after awakenings
  3. Early-morning awakening with inability to return to sleep

And, all of:

  a. The sleep disturbance causes clinically significant distress or impairment in social, occupational, educational, academic, behavioral, or other important areas of functioning
  b. It occurs at least three nights per week
  c. It is present for at least three months
  d. It occurs despite adequate opportunity for sleep
  e. It is not better explained by and does NOT occur exclusively during the course of another sleep-wake disorder

Insomnia Disorder

f. It is NOT attributable to the physiological effects of illicit substances or medications
g. Coexisting mental disorders and medical conditions do NOT adequately explain the predominant complaint of insomnia

DSM-5 criteria – additional notes

- When diagnosing insomnia, practitioners should specify whether it occurs with:
  1. Non-sleep disorder mental comorbidities
  2. Other medical comorbidities
  3. Another sleep disorder
- Insomnia is not solely defined by amount of sleep, but sleep quality and type as well

Further diagnostic considerations/qualitative descriptions:

- Duration of insomnia
  1. Transient – symptoms last for < 1 week
  2. Acute – symptoms last for < 1 month
  3. Chronic – symptoms last for > 1 month

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)

Insomnia Disorder

- Timing of insomnia
  - Onset insomnia – inability to fall asleep
  - Maintenance insomnia – inability to stay asleep
- Etiology of insomnia
  - Primary insomnia – sleep issues not directly associated with health condition
  - Secondary insomnia – sleep issues are associated with another health condition
- Other potential causes of insomnia:
  - Life stressors
  - Emotional discomfort
  - Environmental factors (e.g., noise, light, or temperature issues)
  - Interferences in normal sleep schedule (e.g., jet lag, working night shift)
  - Poor dietary intake and exercise routine
  - Using electric devices near bedtime/while in bed (e.g., cell phones, TV)

Insomnia Disorder

- Short-term consequences of insomnia:
  - Sleepiness during the day
  - General tiredness
  - Irritability
  - Problems with concentration or memory
  - Poor sex drive
  - Poor performance at work and with other daily responsibilities
- Long-term consequences of insomnia:
  - Weakened immune system
  - Stroke and cardiovascular disease
  - High blood pressure
  - Depression and anxiety
  - Shortened life expectancy

Insomnia Disorder

How is insomnia typically diagnosed?

- A provider will note sleep disturbances based on patient self-report, which will lead to an evaluation consisting of:
  - Physical exam
  - Medical history
  - Extensive sleep history
  - Data from a sleep diary (1-2 weeks)
  - Report from any sleeping partners
  - Sleep study or related medical tests

Brief Review: Pharmacological Treatment for Insomnia

- What has been approved to treat insomnia
  - Benzodiazepines, non-benzodiazepine hypnotics
  - Melatonin agonists, doxepin, suvorexant
- Though not approved to treat insomnia, some providers prescribe other medications that have a sedating effect
  - Antidepressants, diphenhydramine, neuroleptics, barbiturates
- General consensus around sleep medications:
  - Useful as adjunctive to therapy rather than the only strategy of change
  - For those who require medication for sleep onset insomnia, use a short-acting agent
  - For those who require medication for maintenance insomnia, use a long-acting agent
  - For those who require medication for maintenance insomnia, use a long-acting agent
  - Long-term treatment with medication only is not recommended for insomnia

OXFORD

International Journal of Neuropsychopharmacology (2019) 22(4): 270–277

doi:10.1093/ijnp/pyz007
Advance Access Publication: February 5, 2019
Regular Research Article

REGULAR RESEARCH ARTICLE

An Insight into Z-Drug Abuse and Dependence: An Examination of Reports to the European Medicines Agency Database of Suspected Adverse Drug Reactions

Fabrizio Schifano, Stefania Chiappini, John M. Corkery, Amira Guirguis

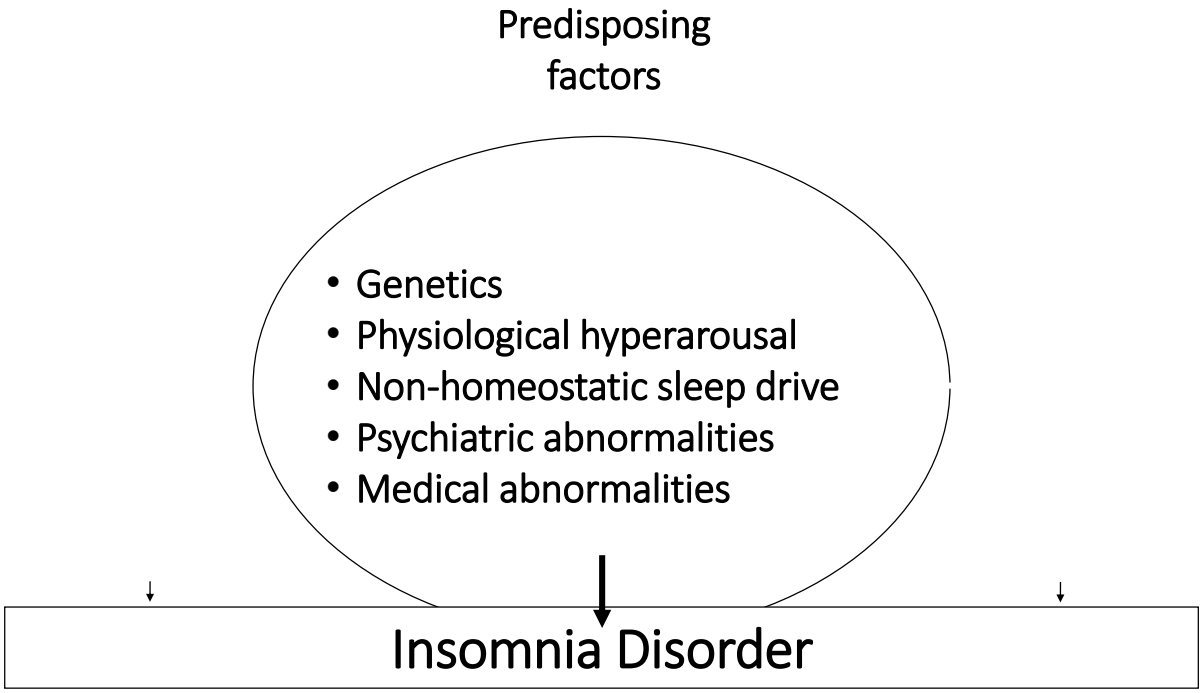
Psychopharmacology, Drug Misuse and Novel Psychoactive Substances Research Unit, School of Life and Medical Sciences, University of Hertfordshire, Hatfield, United Kingdom.

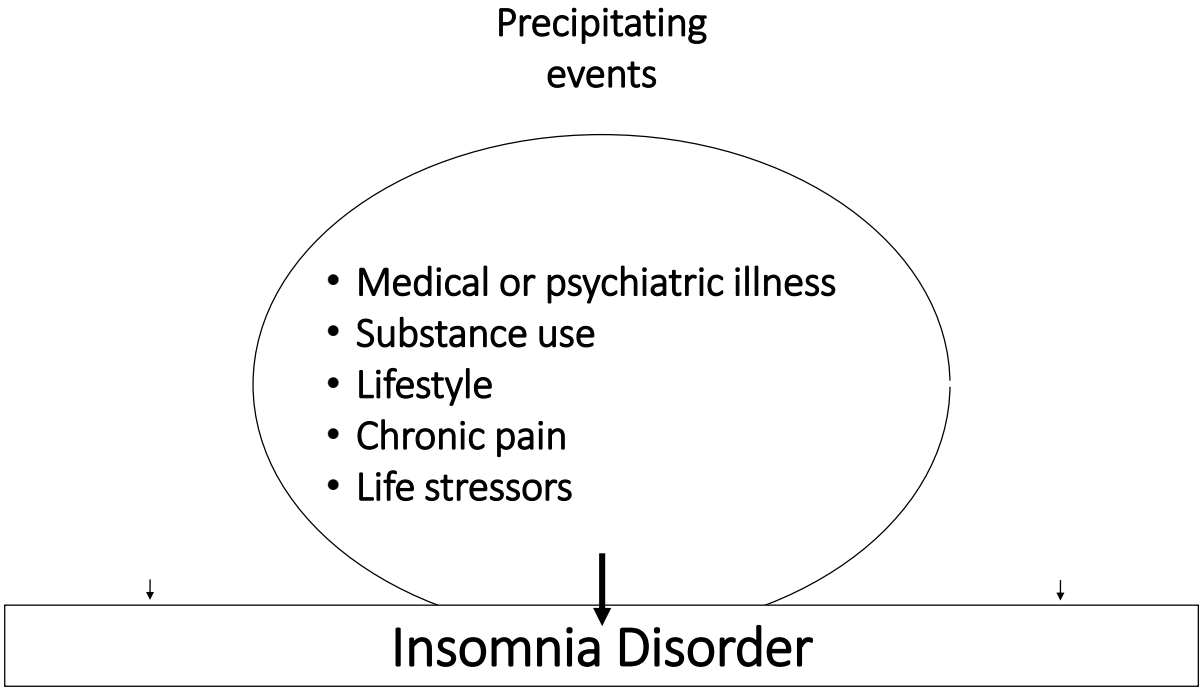
Correspondence: Stefania Chiappini, MD, Psychopharmacology, Drug Misuse and Novel Psychoactive Substances Research Unit School of Life and Medical Sciences, University of Hertfordshire, Hertfordshire AL10 9AB, UK (stefaniachiappini9@gmail.com).

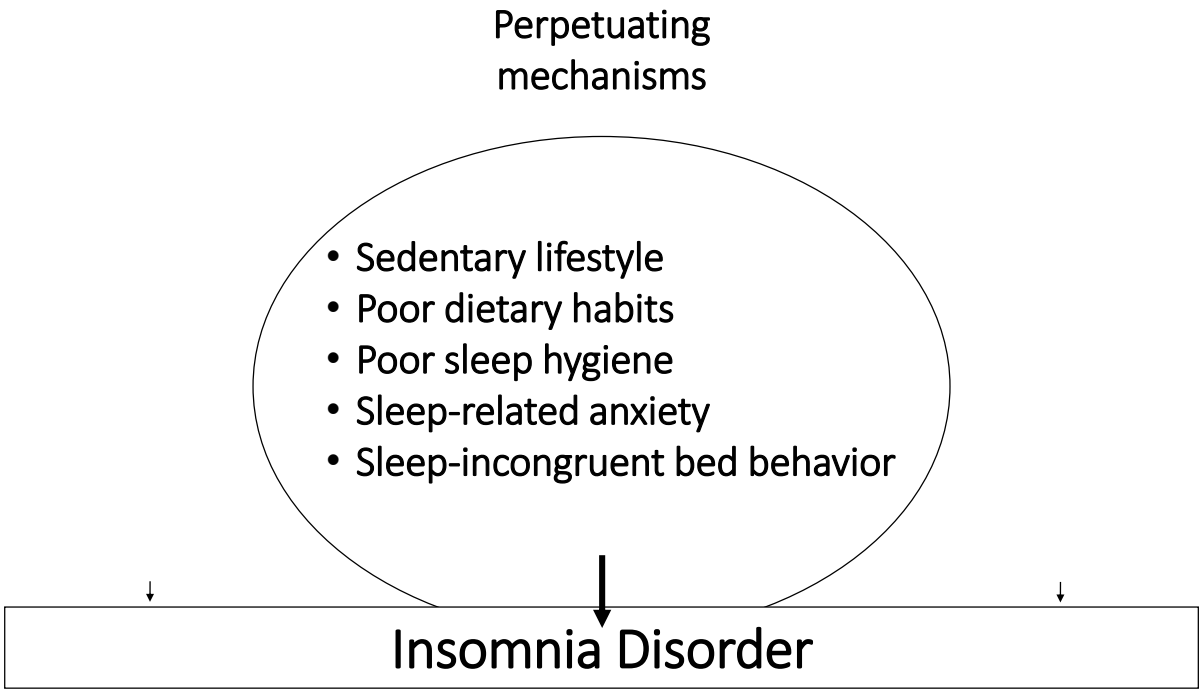
- Data from the European Medication Monitoring System were used
- Of the adverse drug events, 11%-13% related to suspected misuse or abuse. Intentional overdose and drug use disorders were the most common forms of adverse drug events
- CBT-I is a brief, six-session multi-component treatment that addresses patients' cognition and behaviors that interfere with sleep

CBT-I: Non-pharmacological Treatment for Insomnia

- It is based on Spielman's conceptual model of primary insomnia that identifies:
  a. Predisposing factors
  b. Precipitating events
  c. Perpetuating mechanisms that contribute to the development and maintenance of chronic insomnia




Precipitating events
• Medical or psychiatric illness
• Substance use
• Lifestyle
• Chronic pain
• Life stressors
Insomnia Disorder


Perpetuating mechanisms
• Sedentary lifestyle
• Poor dietary habits
• Poor sleep hygiene
• Sleep-related anxiety
• Sleep-incongruent bed behavior
Insomnia Disorder

CBT-I: Non-pharmacological Treatment for Insomnia

- Often, once insomnia symptoms are encountered, people often develop maladaptive strategies that are intended to improve sleep, but actually end up worsening it
- Could include avoidance behaviors such as:
  - Cancelling planned activities due to fear that it will interfere with sleep
  - Spending excessive time in bed
  - Developing rigid sleep-related rituals
- These behaviors are manifestations of increased sleep effort
  - The individual is trying too hard to sleep
- In response to poor sleep, people develop sleep-interfering cognitions such as overestimating or worrying about the negative consequences of poor sleep and approach bedtime with fear of failure
- These behavioral and cognitive responses to sleep problems, and people's practices for coping, create a vicious cycle by prolonging and exacerbating the very problems they are trying to solve

CBT-I: Non-pharmacological Treatment for Insomnia

- CBT-I aims to alter behaviors that sustain or add to sleep problems and correct cognitions that drive these behaviors

1. Primary behavioral components of CBT-I
   - Sleep restriction therapy
   - Stimulus control
2. Primary cognitive components of CBT-I
   - The cognitive model
3. Physiological component of CBT-I
   - Reduce physiological hyperarousal
   - Reduce cognitive hyperarousal

CBT-I: Does It Work?

- Research on CBT-I has consistently demonstrated strong effects, and so newer work is largely focused on specific populations
- This study focused on patients with obstructive sleep apnea
- Three-arm study
  - CBT-I and then positive airway pressure (PAP) device use
  - Self-monitoring and then both CBT-I and PAP use
  - Self-monitoring and then only PAP use

OXFORD Sleep Research Society®

SLEEP, 2020, 1–10

doi: 10.1093/sleep/zsaa041
Advance Access Publication Date: 14 March 2020
Original Article

ORIGINAL ARTICLE

A randomized controlled trial of CBT-I and PAP for obstructive sleep apnea and comorbid insomnia: main outcomes from the MATRICS study

Jason C. Ong[1,*,•], Megan R. Crawford[2], Spencer C. Dawson[1], Louis F. Fogg[3], Arlener D. Turner[4,•], James K. Wyatt[5,•], Maria I. Crisostomo[6], Bantu S. Chhangani[6], Clete A. Kushida[7], Jack D. Edinger[8], Sabra M. Abbott[1,•], Roneil G. Malkani[1], Hrayr P. Attarian[1] and Phyllis C. Zee[1]

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CBT-I: Does It Work?

OXFORD Sleep Research Society®

SLEEP, 2020, 1–10

doi: 10.1093/sleep/zsaa041
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[1]Center for Circadian and Sleep Medicine, Department of Neurology, Northwestern University Feinberg School of Medicine, Chicago, IL, [2]School of Psychological Sciences and Health, University of Strathclyde, Glasgow, UK, [3]College of Nursing, Rush University Medical Center, Chicago, IL, [4]Center for Sleep and Brain Health, Department of Psychiatry, New York University, New York, NY, [5]Department of Psychiatry and Behavioral Sciences, Rush University Medical Center, Chicago, IL, [6]Department of Medicine, Rush University Medical Center, Chicago, IL, [7]Division of Sleep Medicine, Department of Psychiatry and Behavioral Sciences, Stanford University, Stanford, CA and [8]Division of Pulmonary, Critical Care, and Sleep Medicine, Department of Medicine, National Jewish Health, Denver, CO

A randomized controlled trial of CBT-I and PAP for obstructive sleep apnea and comorbid insomnia: main outcomes from the MATRICS study

- Participants had to have lab-validated sleep apnea problems and subjective poor sleep, for at least 3 months; no other acute psychiatric condition; no narcolepsy; no severe apnea requiring immediate intervention; no excessive dozing (e.g., falling asleep while driving); stable household situation to be able to use PAP
- 121 participants were recruited
  - 47% women, average age of 50, mostly White (49%) and African American (42%)
  - Low loss to follow-up
- Results
  - Sleep improved in all three conditions, but results were superior for those who also got CBT-I
    - The timing did not matter, though

FULL TEXT ARTICLE

A systematic review and meta-analysis of randomized controlled trials of cognitive behavior therapy for insomnia (CBT-I) in cancer survivors

Jillian A. Johnson, Joshua A. Rash, Tavis S. Campbell, Josée Savard, Philip R. Gehrman, Michael Perlis, Linda E. Carlson and Sheila N. Garland

Sleep Medicine Reviews, 2016-06-01, Volume 27, Pages 20-28, Copyright © 2015 Elsevier Ltd

- Cancer is related to many biopsychosocial factors that may impact sleep
- Eight RCTs were identified for analysis
  - 752 total cancer patients
    - 434 CBT-I and 318 control
  - 5 were on breast cancer, the other three included men and women with various forms of cancer
- CBT-I was usually once a week for 5-8 weeks, in individual, group, or online formats
- CBT-I demonstrated improvements in sleep efficiency, sleep onset latency, waking after sleep onset, and reduction in insomnia severity

Cognitive and behavioural therapy for insomnia (CBT-I) in psychiatric populations: A systematic review

DANIEL J. TAYLOR[1] & KRISTI E. PRUIKSMA[2]

[1]Department of Psychology, University of North Texas, Denton, Texas, and [2]Department of Psychiatry, University of Texas Health Science Center at San Antonio, Texas, USA

- International Review of Psychiatry, 2014
  - Researchers reviewed 16 studies (n = 571) that assessed CBT-I's efficacy for insomnia with patients who had one or more of multiple comorbidities between depression, anxiety, PTSD, alcohol use, or hypnotic use
  - Sleep efficiency: effect size = 0.76
  - Insomnia severity: effect size = 1.00
  - Comorbid symptom reduction: effect size range = 0.34 to 1.20

CBT-I: How do you do it?

Session I – assessment interview

- The first session of CBT-I should consist of a clinical interview that provides the clinician with enough information to:
  1. Determine if the patient is appropriate for CBT-I
  2. Develop an individualized treatment plan based on the patient's experiences and sleep issues

CBT-I: Assessment Interview

- Assess the current sleep pattern
  - Ask the patient how their sleep has been during the past week
    - If the past week was unusual, have them describe a typical week
  - If they are describing a great deal of variability in their sleep…
    - Focus the discussion by asking about the number of times in the last week that problematic aspects of their sleep were present
  - Many will speak in general terms or struggle to recall their sleep schedule
    - Ask them about last night or the worst night in the last week
    - Then ask about other nights and encourage patients to make their best estimates
- Things to ask about when assessing their current sleep pattern:
  - Sleep schedule
    - When do you get into bed? When do you turn off the lights?
    - When do you begin trying to go to sleep? Is there variability in weekend/weekday?

CBT-I: Assessment Interview

  - Pre-bedtime activities
    - Failure to unwind can lead to being over-activated at bedtime
    - What do you do during the two hours prior to your bedtime?
  - Problems at the beginning of the night
    - Do you have trouble falling asleep? How long does it take for you to fall asleep?
    - What do you do when you have difficulty falling asleep?
  - Problems in the middle of the night
    - Do you wake up in the middle of the night? How many times? For how long?
    - When does it occur? What do you do if you wake up in the middle of the night?
  - Morning wake-up time and time out of bed
    - What is your wake-up time and when do you get out of bed? Are these different?
  - Problems at the end of the night
    - Do you wake up earlier than planned and then cannot go back to sleep?
    - Do you have difficulty waking up in the morning? Do you hit the snooze button often?

CBT-I: Assessment Interview

- Estimated total sleep time
  - On average, how many hours of sleep do you get?
- Sleep medications
  - Do you take sleep medications? (If so, get specifics about types/usage details)
- Substances as sleep-aids
  - Do you use alcohol/cannabis/etc. to help you sleep?
  - If so, how frequently? How much? When?

- Things to ask about when assessing their current sleep pattern:
  - Bedroom environment
    - Do you feel safe in your bedroom? Is your mattress comfortable? How old is it?
    - How much light is in the room at night and in the morning? Is it noisy?
    - Is the temperature comfortable? Do you have a bed partner that disrupts your sleep?
    - Caregiving issues that disrupt your sleep? Do you have a pet that disrupts your sleep?

CBT-I: Assessment Interview

- Precipitating factors
  - When did this sleep problem start? What was going on in your life when it started?
  - What have you tried to improve your sleep?
- Premorbid sleep schedule
  - What did your sleep look like prior to this problem?

- Other items to address during the assessment session:
  - Assess circadian chronotype
    - Ask series of questions that answers whether they are a morning- or evening-person
      - Are they a night owl or an early bird?
  - Assess day-wake time behaviors that can impact sleep
    - Do you nap? If given the opportunity, would you be able to fall asleep for a nap?
      - Frequency, length, and timing of daytime naps

CBT-I: Assessment Interview

    - Distinguish between, and ask about, napping and dozing
  - Assess simulant use
    - Do you use stimulants? If so, which ones, how much, and when are they used?
      - Caffeine, nicotine, specific prescription and non-prescription drugs
  - Daytime activity levels
    - How busy are you during the day?
    - Do you exercise? If so, when, what type, and how vigorous?
  - Assess factors that contribute to hyperarousal or hyperactivation
    - Do you ever find that you are working at getting to sleep? Is it frustrating?
    - Do you think about your sleep during the day?
  - Assess cognitions about sleep
    - Ask questions to elicit dysfunctional sleep beliefs, preoccupation with sleep, etc.

CBT-I: Assessment Interview

  - Assess possible comorbidities
    - This helps determine if other treatment is needed adjunctively
    - Ask questions about sleep apnea and restless leg syndrome – two common sleep disorders
- What is the patient's treatment goal?
- Determine insomnia symptom severity
  - Use the Insomnia Severity Index (ISI)

CBT-I: The Sleep Diary

- The last step of assessment session – the sleep diary
  - The sleep diary is the foundation of treatment
    - Information from it will inform sleep restriction therapy and stimulus control
    - The sleep diary allows for tracking of change during treatment
    - It helps alter patient's misperceptions about their sleep pattern
  - Primary interest is in tracking change in sleep-wake experiences over time
  - Have the patient complete a sleep diary, daily
    - Ask them to fill it out in the morning to ensure accurate recall
    - Ensure they don't perseverate over accuracy – just need best estimates
  - Show the patient, in session, how to complete the sleep diary

Weekly Averages: **Time in Bed = [ ] Total Sleep Time = [ ]** **Sleep Efficiency = [ ]**	**Sample***	**Day 1**	**Day 2**	**Day 3**	**Day 4**	**Day 5**	**Day 6**	**Day 7**
How long did you nap/doze?	30 min nap							
What time did you get in bed?	9:00PM							
What time did you try to go to sleep?	10:00PM							
How long did it take to fall asleep?	4 hours							
How many times did you wake up, not counting your final awakening?	1 time							
In total, how long did these last for?	1 hour							
What time was your final awakening?	7:00							
Did you wake up earlier than desired?	Yes							
If so, how many minutes earlier?	2 hours							
What time did you get out of bed?	9:00							
How would you rate the quality of your sleep?	[ ] Poor [ ] Fair [ ] Good [ ] Very Good	[ ] Poor [ ] Fair [ ] Good [ ] Very Good	[ ] Poor [ ] Fair [ ] Good [ ] Very Good	[ ] Poor [ ] Fair [ ] Good [ ] Very Good	[ ] Poor [ ] Fair [ ] Good [ ] Very Good	[ ] Poor [ ] Fair [ ] Good [ ] Very Good	[ ] Poor [ ] Fair [ ] Good [ ] Very Good	[ ] Poor [ ] Fair [ ] Good [ ] Very Good
Personal notes/comments	Mad that I cant sleep							

CBT-I: Case Conceptualization for Treatment Planning

- Sleep drive
  - Factors that weaken sleep drive, e.g., extended time in bed
- Biological clock
  - Factors that weaken the signals from biological clocks, e.g., irregular wake or out of bed time
- Hyperarousal
  - Manifestations of hyperarousal or excessive effort, e.g., excessive sleep effort
- Unhealthy sleep behaviors
  - Unusual or maladaptive behaviors, e.g., nocturnal eating
- Comorbidities
  - Other illnesses that can impact sleep, e.g., PTSD and depression
- Medications and substances
  - Prescribed, legal, and illicit substances, e.g., sleep medication use, excessive use and subsequent dependence on nicotine/alcohol, use of caffeinated sport supplement

CBT-I: Case Conceptualization for Treatment Planning

- Predisposing, precipitating, and perpetuating factors
  - Patient-specific factors, e.g., high trait anxiety, job stress, or dysfunctional beliefs about sleep
- Other
  - Anything else that can impact sleep, e.g., problems with bed partner

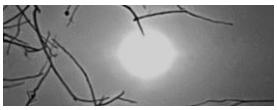
CBT-I: The Middle Stages

- Because CBT-I is tailored to fit the patient's needs, the middle stages of treatment are flexible
- Sessions 2-5 should address the following:
  - Behavioral components of CBT-I
    - Sleep restriction therapy
    - Stimulus control
  - Cognitive components of CBT-I
    - Dysfunctional beliefs about sleep
  - Physiological and cognitive hyperarousal
    - Sleep hygiene
    - Relaxation strategies
- Sessions 2-5
  - Each session should begin by reviewing the sleep diary
    - Calculate total sleep time (TST), time in bed (TIB), and sleep efficiency (SE%)

CBT-I: The Middle Stages

  - Have the patient complete the ISI at the beginning of each session
    - Objectively measure insomnia symptoms and chart progress across treatment
  - If possible, introduce stimulus control and sleep restriction in session 2
  - In each session, emphasize the most relevant components and add subsequent components based on the patient's case conceptualization
  - Once sleep restriction is introduced, modify TIB at each session, as necessary
- Stimulus control (Bootzin, 1972)
  - The bed has become conditioned to wakefulness rather than sleep
  - Conditioned arousal is developed through repeated experiences of frustration, anxiety, or tension when the patient is unable to sleep
  - Stimulus control aims to decrease the association between bed and arousal and conversely increase the bed as a cue for sleep
    - i.e., we are working to extinguish the conditioned response (frustration) to the conditioned stimulus (bed)

CBT-I: The Middle Stages



- Stimulus control instructions:
  - Go to bed only when sleepy (not just fatigued or tired)
  - Use the bed and bedroom only for sleep (and sexual activity)
  - If unable to go to sleep, get out of bed. Return only when sleepy again
  - Wake up at the same time every day regardless of the amount of sleep
  - Do not nap
- Explore obstacles to adherence to stimulus control instructions
  - Difficulty identifying sleepiness (compared to fatigue)
  - Difficulty getting out of bed when unable to sleep
  - Bed partner-related obstacles
  - Difficulties adhering to the designated wake time
- Sleep restriction therapy (Spielman et al., 1987)
  - It is a gradual, multi-step process to improve sleep quality by decreasing wakefulness after sleep onset
  - Because the word restriction may be off-putting or scary to patients, it often is called sleep-efficiency training during sessions

CBT-I: The Middle Stages

- The first step is to reduce the patient's TIB to the time the patient is currently able to sleep (make TIB = TST)
  - The goal is for this to lead to a marked decrease in unwanted wakefulness and improvement in sleep quality
  - Once effect of consolidating sleep is attained, TIB can be slowly expanded

CBT-I: Determining TIB for Sleep Restriction Therapy

- To determine earliest bedtime in sleep restriction therapy, start at the designated wake time set by the patient and count backward 6 hours (new TIB). For example, if the wake time is 8AM, then the new earliest bedtime would be 2AM
- This means that the patient's TIB was restricted 4 hours (from 10 to 6 hrs)

Week 1
Sleep Diary:
Avg. TIB: 10 hrs
Avg. TST: 6 hrs

Recommended Week 2 TIB
for Restriction:
TIB: 6 hrs

CBT-I: The Middle Stages

- Explore obstacles to adherence to sleep restriction instructions
  - Adhering to TIB window
  - Bed partner-related obstacles
  - Increased anxiety due to sleep restriction
- Safety issues and side effects
  - Daytime sleepiness may emerge during initial stages of sleep restriction
    - Help them avoid driving or conducting other dangerous activities when sleepy
    - If sleepiness becomes a risk, encourage brief naps to offset severe daytime sleepiness
  - If comorbidities exist that are associated with daytime sleepiness (e.g., sleep apnea), sleep restriction may be contraindicated
    - In this case, emphasize stimulus control
  - Sleep restriction could aggravate other pre-existing conditions as well

CBT-I: The Middle Stages

- Instructions for increasing TIB during subsequent sessions
  - After patient follows TIB recommendation for one week, TIB for the next week will be based on sleep efficiency and sleep need
    - Determine sleep efficiency (100*[avg TST/avg TIB])
    - Determine sleep need (either subjectively or there are objective measures available)
  - To increase TIB, sleep efficiency needs to be at 85% or higher
  - In terms of sleep need, if sleep efficiency is at 85% or higher AND:
    - If they aren't reporting increased need for sleep, don't change TIB
    - If they are reporting a moderate need for sleep, increase TIB by 15 minutes
    - If they are reporting a high need for sleep, increase TIB by 30 minutes
  - If sleep efficiency is below 85% and there is low sleep need
    - Restrict TIB by additional 15 minutes
    - Explore why there might have been insufficient progress toward improved sleep

CBT-I: The Middle Stages

- Addressing high activation and high arousal
  - Create a time to unwind before bedtime
    - Create a buffer zone between being active and being quiet and calm
  - Address intrusive worries
    - Scheduled worry time prior to the buffer zone
  - To-do list for tomorrow
    - Create tomorrow's to-do list prior to the buffer zone
  - Relaxation training
    - Teach relaxation methods that can reduce tension and anxiety when trying to sleep
  - Shift focus from anxiety when trying to relax
    - In addition to relaxation training, find activities that have indirect calming effect

CBT-I: The Middle Stages

- Discourage behaviors that reflect trying too hard to sleep
  - Some are obvious (e.g., lying in bed, tossing and turning for hours)
  - Others are less obvious (e.g., avoiding doing anything in the evenings for fear that it will prevent sleep)
- Sleep education to help change sleep-related thoughts and beliefs
  - Adequate scientific information about sleep can be helpful
    - e.g., no single amount of sleep that "fits" everyone
    - e.g., quality of sleep is more important than quantity
  - Overall, knowledge about sleep and its regulation, and the underlying rationale behind CBT-I strategies can help reshape misleading cognitions about sleep

Cognitive restructuring

- As with general CBT, cognitive restructuring involves identifying, evaluating, and modifying inaccurate or maladaptive thoughts

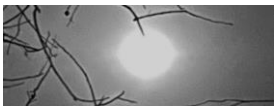
CBT-I: The Middle Stages

- In CBT-I focus on sleep-related thoughts that increase arousal and interfere with sleep either directly (e.g., sleep-incompatible thoughts) or indirectly (e.g., interfering with adherence to behavioral components of CBT-I)

1. Provide patient with psychoeducation on the cognitive model
   - The interplay between our thoughts, emotions, and subsequent actions
2. Provide patient with psychoeducation on automatic thoughts and the process of challenging and replacing them with a healthier thought
3. Provide patient with thought log and teach them how to use it
   - Could be incorporated into their homework each week alongside sleep diary

- Examples of sleep-interfering cognitions and beliefs
  - Nighttime worries about negative consequences of insufficient sleep
    - Catastrophizing
      - If I don't get enough sleep, I'll definitely miss work and then get fired

CBT-I: The Middle Stages



  - Probability over-estimation
    - I've been laying in bed for 15 minutes and haven't fallen asleep; I'm never going to fall asleep
  - Morning predictions
    - I had a lousy night, so I will definitely have a terrible day
- Coping cards
  - Utilize index cards where your patient writes down strategies that were developed during the last session to deal with:
    - Sleep-interfering thoughts, consequences of poor sleep, and struggles with adhering to recommendations made in last session

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CLINICAL REVIEW

Changes in dysfunctional beliefs about sleep after cognitive behavioral therapy for insomnia: A systematic literature review and meta-analysis

Manu Thakral [a, b, *], Michael Von Korff [c], Susan M. McCurry [b], Charles M. Morin [d], Michael V. Vitiello [e]

- Restructuring thoughts is integral to CBT-I, but most studies focus on the outcomes of changes in sleep and not changes in beliefs about sleep
- Maladaptive beliefs about sleep can promote worry and rumination, frustration, etc.
- 16 studies were identified for inclusion
  - 1964 participants
    - 1134 in CBT-I, 830 in control groups

Changes in dysfunctional beliefs about sleep after cognitive behavioral therapy for insomnia: A systematic literature review and meta-analysis

- CBT-I was delivered over 6-10 sessions
  - 4 in person, 6 online, 3 individual, 4 telephone
- Control groups included
  - Wait list, education, medical placebo, alternative behavioral interventions
- Results indicated a large reduction in dysfunctional beliefs about sleep in the CBT-I conditions (g = -0.90)
  - 3 studies included follow-ups; these indicated that effects persisted (g = -1.04)
- Take-homes:
  - CBT-I was successful in reducing dysfunctional beliefs about sleep

CBT-I: The Final Session

- Typically occurs at session 6
  - However, treatment may be shorter or longer depending on patient issues
- Relapse prevention
  - Have patient discuss what they gained from treatment and what was helpful
  - Develop an action plan for continuing new sleep behaviors (e.g., stimulus control) and how to address sleep interfering issues if they were to arise
  - Identify coping strategies for life stressors
  - Determine how to use sleep diary moving forward
  - Do they feel confident that they could engage in sleep restriction therapy on their own if they encountered a period of poor sleep?
  - Provide info about re-attending therapy if booster sessions are needed

CBT-I: Additional Considerations

- If your CBT-I patient has insomnia that is comorbid with other medical and psychiatric conditions, review literature about how best to adapt aspects of treatment to ensure the best outcome for your patient
- There is literature on CBT-I with patients who, in addition to insomnia, have any number of other conditions
- Also, given that sleep disturbances are a primary symptom of myriad medical and psychiatric conditions, consider how to implement components of CBT-I into routine mental health treatment

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CLINICAL REVIEW

Cognitive behavioral therapy for insomnia in patients with chronic pain – A systematic review and meta-analysis of randomized controlled trials

Janannii Selvanathan [a, b], Chi Pham [a, b], Mahesh Nagappa [c], Philip W.H. Peng [a], Marina Englesakis [d], Colin A. Espie [e], Charles M. Morin [f], Frances Chung [a, b, *]

- Chronic pain is a very prevalent condition
  - Related to osteoarthritis, fibromyalgia, musculoskeletal pain, and more
- Insomnia is very common among those with chronic pain, affecting more than half of chronic pain patients
- Pain impairs sleep, and poor sleep exacerbates pain
  - So, intervening at the sleep part of the cycle might be fruitful

CLINICAL REVIEW

Cognitive behavioral therapy for insomnia in patients with chronic pain – A systematic review and meta-analysis of randomized controlled trials

- 12 studies were ultimately identified for this review
  - Total of 762 patients
  - Mostly done in the U.S. (n = 9)
  - The studies had patients with chronic pain in general, fibromyalgia, or osteoarthritis
  - All RCTs used CBT-I
    - 4 to 10 weeks, 15-120 minutes per week, face-to-face
    - Control groups varied, including passive (e.g., wait list) or active (e.g., sleep hygiene education)
- Unfortunately, study quality was low
- CBT-I had strong effects on sleep at post-treatment (SMD = 0.89)
- CBT-I was supported for both group and individual interventions at post-treatment
- The effect persisted at follow-up (SMD = 0.56)

CLINICAL REVIEW

Cognitive behavioral therapy for insomnia in patients with chronic pain – A systematic review and meta-analysis of randomized controlled trials

- Sleep-onset latency, wake after sleep onset, total sleep time, and sleep efficiency were all improved in CBT-I versus control conditions
- Pain was also reduced, though the effect was smaller than the effect for sleep, but relatively stronger in group-based interventions
- At follow-up, there was no effect of treatment on pain
- In the CBT-I group, depression improved at post-treatment but gains were not maintained at follow-up
- Anxiety did not improve at post-treatment or follow-up
- Fatigue did not improve at post-treatment or follow-up
- Take-homes:
  - Sleep and pain improved among chronic pain patients with insomnia
  - Depression also improved, but the gains were not maintained
  - Anxiety and fatigue did not improve
  - CBT-I can assist with sleep problems, but more interventions are likely needed to address other aspects of care needed for patients with chronic pain

Learning Goals

- Identify the relationship between sleep and health
- Recognize the symptoms of insomnia disorder
- Describe research on the effectiveness of CBT-I as a treatment for insomnia
- Describe how to apply CBT-I with patients who have insomnia disorder

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Cognitive Behavioral Therapy for Insomnia (CBT-I)

Mike C. Parent, PhD