



# **Insomnia: A Public Health Concern That Intensified With COVID**

February, 2023

James Westphal, MD

# Educational Objectives

- At the end of this session, physicians will be able to verbalize:
  1. The mental health risks of chronic insomnia.
  2. The recommended first line treatment for chronic insomnia.
  3. The limitations of pharmacological interventions for insomnia.
  4. The limited role of sleep hygiene in the treatment of chronic insomnia.

# Sleep Was A Public Health Issue Before COVID

- Good sleep is necessary for good physical and mental health and a good quality of life.
- Insufficient sleep is a pervasive and prominent problem.
- A considerable body of evidence suggests that insufficient sleep causes hosts of adverse medical and mental dysfunctions.
- **Globally, insufficient sleep is prevalent across various age groups, considered to be a public health epidemic that is often unrecognized, under-reported, and that has rather high economic costs.**

Chattu, Manzar, Kumary et al., 2018

## Sleep as a Public Health Issue (2)

- **The increased usage of smart phones and electronic devices is worsening the epidemic.**
- **Insufficient sleep leads to the derailment of body systems, leading to increased incidences of cardiovascular morbidity, increased chances of diabetes mellitus, obesity, derailment of cognitive functions, vehicular accidents, and increased accidents at workplaces.**
- Adolescents with insufficient sleep are likely to be overweight and may suffer from depressive symptoms.
- Sleep quality assessments as an important early risk indicator, thereby reducing the incidence of a wide spectrum of morbidities.

# COVID Effects On Sleep

- Objectives: No systematic review or meta-analysis has yet been conducted to examine the impact of the pandemic on the prevalence of sleep problems among the general population, health care workers, or patients with COVID-19.
- Results: Forty-four papers, involving a total of 54,231 participants from 13 countries.
- **Patients with COVID-19 appeared to be the most affected group**, with a pooled rate of 74.8%. Health care workers and the general population had comparative rates of sleep problems, with rates of 36.0% and 32.3%.
- Conclusions: **The prevalence of sleep problems during the COVID-19 pandemic is high and affects approximately 40% of people from the general and health care populations.**
- Patients with active COVID-19 appeared to have a higher prevalence rates of sleep problems.

# Insomnia Epidemiology

- Epidemiologists have published more than **50 studies of insomnia based on data collected in various representative community-dwelling samples or populations.**
- These surveys provide estimates of the **prevalence of insomnia according to four definitions: insomnia symptoms, insomnia symptoms with daytime consequences, sleep dissatisfaction and insomnia diagnoses.** (Benca & Buysse, 2018).
- About **one-third of a general population reports at least one of insomnia symptom.**
- **When daytime consequences of insomnia are taken into account, the prevalence is between 9% and 15%.**

# 7 Insomnia Was Prevalent Before COVID

- **Subjective sleep dissatisfaction represents 8-18% of the general population.**
- **The prevalence of insomnia diagnoses is 6%.** The appendix contains the DSM 5 diagnostic criteria for insomnia.
- Insomnia has a **higher prevalence in women** than in men.
- **The prevalence of insomnia symptoms generally increases with age,**
- While the **rates of sleep dissatisfaction and insomnia diagnoses have little variation with age.**

Ohayon, 2002

## Insomnia Can Often Be Chronic

- There is much evidence that insomnia can be a long-term disorder.
- In one large UK study, **about three-quarters of patients reported symptoms lasting at least a year** (Morphy et al., 2007).
- In a population-based three-year longitudinal study, **46% of subjects who had insomnia at baseline still had it at the three-year time point.**
- **The course of insomnia was more likely to be persistent in those with more severe insomnia at baseline and in women and older adults** (Morin et al., 2009).



# Health Consequences of Insomnia

- Insomnia is associated with **significant morbidity in terms of health problems and health-care utilization, work absenteeism and reduced productivity, and risk of non-motor-vehicle accidents** (Daley, Morin, LeBlanc et al., 2008).
- Both **poor sleep habits and sleep disorders are highly prevalent among adults with type 2 diabetes.**
- In observational studies, short sleep duration, obstructive sleep apnea, shift work, and **insomnia are all associated with higher risk of incident type 2 diabetes and may predict worse outcomes in those with existing diabetes.**

Ogilvie and Patel, 2019

## Health Consequences of Insomnia (2)

- **Short sleep duration along with other dimensions of poor sleep have been associated with obesity both in cross-section and longitudinal studies.**
- **These data suggest a potential causal relationship between poor sleep and greater rates of weight gain that may be related to effects of sleep on dietary intake or physical activity (Ogilvie and Patel, 2017).**
- **Insomnia causes decreased quality of life, is associated with impaired functioning in many areas, and leads to increased risk of depression, anxiety and possibly diabetes and cardiovascular disorders (Wilson, Anderson, Baldwin et al., 2019).**

# Insomnia and Mental Health

- **Insomnia is a common feature of many psychiatric disorders.**
- **Insomnia can also be a comorbid disorder, often contributing to poor outcomes and treatment failure.**
- Depression and anxiety are the most common comorbid psychiatric disorders in insomniacs (Roth, 2007).
- For some patients who do respond to psychiatric treatment for depression, **their insomnia persists after their mood symptoms have remitted, indicating that their insomnia needs to be a separate focus of treatment.**

# Insomnia and Major Depression

- **Persistence and worsening of poor sleep or insomnia, but not their full remission, are significant predictors of incident depression.**
- There is a significant relationship between the **severity of insomnia and incident depression** (Fernandez-Mendoza, Shea, Vgontzas et al., 2015).
- It has traditionally been assumed that insomnia is secondary to the psychiatric disorder; however, given the chronicity of insomnia, it is possible that in some, if not most, cases the **insomnia precedes the psychiatric disorder.**

Roth, 2007

# Insomnia, Anxiety and Major Depression

- Insomnia represents a significant risk for the development of a subsequent psychiatric disorder.
- In a large-scale European population-based study (N=14,915), insomnia **more often preceded rather than followed incident cases of a mood disorder** (Ohayon & Roth, 2003).
- This effect is even more pronounced for relapses of the mood disorder, where in **56.2% of cases, insomnia symptoms preceded symptoms of a mood disorder relapse**.
- In chronic insomnia patients with a **comorbid anxiety disorder, the first occurrence of anxiety or a relapse preceded insomnia** in most instances.

# Insomnia, Anxiety and Major Depression (2)

- Longitudinal studies examined the course of psychiatric disorders among insomnia patients.
- The majority of studies used follow-up periods ranging from 1 to 3-years.
- **In all of these studies, insomnia has been found to confer a substantial risk for the development of a depressive disorder** (Breslau, Roth, Rosenthal et al., 1996; Chang, Ford, Mead et al., 1997).
- The relative risk was approximately 5 (range 2-40).
- Some studies also reported an increased risk for **anxiety or drug abuse, neither of these was consistently found.**
- Finally, longitudinal studies in subjects with affective disorders show that **depressed patients whose insomnia persists will have a short time to relapse.**

Perlis, Giles, Buysse et al., 1997; Fava, Grandi, Canestrari et al., 1990

## Insomnia is the Most Prevalent Response to Stress

- The 2016 wildfires in Fort McMurray (Alberta, Canada) led to displacement of 88,000 people.
- Estimate the prevalence of post-traumatic stress, major depressive, insomnia, generalized anxiety, and substance use disorders in the adult population of Fort McMurray 1 year after.
- Methods: A phone survey of 1500 evacuees.
- 38% had a probable diagnosis of either post-traumatic stress, major depressive, insomnia, generalized anxiety, or substance use disorder, or a combination of these.
- **Insomnia disorder was the most common, with an estimated prevalence of 28.5%.**

Belleville, Ouellet, Lebel et al., 2021

# Interpersonal Stress is Prevalent Among Adults with Insomnia

- The **interpersonal environment is strongly linked to sleep.**
- Little is known about interpersonal distress and its association with sleep.
- We examined **the associations among interpersonal distress, objective and subjective sleep in people with and without insomnia.**
- Conclusion: **distress from interpersonal problems is associated with greater self-reported arousal and higher percent REM.**
- **Individuals with insomnia who report more distress from interpersonal problems have greater insomnia severity and cognitive arousal, perhaps due to rumination.**



# The Neurobiological Basis of Insomnia is Hyperarousal

- Additional evidence continues to suggest that insomnia is associated with inappropriate physiological arousal.
- Patients with primary insomnia have **increased high-frequency EEG activation, abnormal hormone secretion, increased whole body and brain metabolic activation, and elevated heart rate and sympathetic nervous system activation during sleep.**
- This activation can be measured throughout the day and night and is chronic.
- An animal model that has used odor stress to produce poor sleep in rats has identified specific activated brain sites similar to those found in **human brain metabolic studies to suggest that insomnia is a state in which sleep and arousal systems are both simultaneously active.**

## The Neurobiological Basis of Insomnia is Hyperarousal (2)

- **A central feature of insomnia is hyperarousal characterized as persistent and increased somatic, cognitive and cortical stimulation.**
- **Hyperarousal leads to a state of conditioned arousal that disrupts both sleep and daytime function.**
- Research studies have shown increases in body temperature, heart rate, electroencephalographic activity, catecholamines, and oxygen consumption as a measures of increased metabolic rate and hyperarousal.
- **These findings provide evidence of increased physiological activation in insomnia.**

Chapman, Comas, Hoyos et al., 2018

# Insomnia and Major Depression: Common Etiology?

- The close association of insomnia with depression is likely related to **common underlying pathophysiological mechanisms for sleep and mood regulation that** make the individual vulnerable to both conditions.
- Data have shown that both the diagnosis of insomnia and the severity of the sleep disturbance are related to **over-activation of the hypothalamic-pituitary-adrenal axis and the hypersecretion of cortisol** (Richardson & Roth, 2001).
- Recent evidence suggests that there may be some neuroendocrine and clinical similarities between insomnia and depression.
- **Corticotropin-releasing factor (CRF) dysregulation** has been implicated in the **pathogenesis of psychiatric disorders such as depression** (Gold & Chrousos, 2002) as well as in the mediation of **hyperarousal seen in primary insomnia** (Roth, Roehrs, Pies, 2007).
- This abnormality might represent the **common risk factor**, and therefore, it is quite possible that both disorders would respond to the same therapeutic intervention.

# Primary Care Management of Insomnia

- **A comprehensive sleep history can confirm the diagnosis.**
- **Psychiatric and medical problems, medication use, and substance abuse** should be ruled out as contributing factors.
- Treatment of comorbid conditions alone may not resolve insomnia.
- **Patients with movement disorders (e.g., restless legs syndrome, periodic limb movement disorder), circadian rhythm disorders, or breathing disorders (e.g., obstructive sleep apnea) must be identified and treated appropriately.**
- Referral to a sleep specialist may be considered for refractory cases.

Maness & Khan, 2015

# CBT-I is the First Line Treatment for Insomnia

- Since 1999, the American Academy of Sleep Medicine (AASM) (Edinger, Arnedt, Bertisch et al., 2021), the British (Wilson, Anderson, Baldwin, et al., 2019) the Europeans (Riemann, Baglioni, Bassett et al., 2017) and the American College of Physicians (Qaseem, Kansagara, Forcica, et al., 2016) have all recommended that adult patients receive **cognitive-behavioral therapy (CBT) as first-line treatment for chronic insomnia.**

Skolnik, 2021

## CBT-I is the First Line Treatment for Insomnia (2)

- In 2017, the AASM issued a guideline that addressed pharmacologic treatment, **“All patients with chronic insomnia should receive CBT as a primary intervention.**
- Medications for chronic insomnia should be considered mainly in patients **who are unable to participate in CBT I, who still have symptoms despite having done behavioral treatments or in select cases as a temporary adjunct to CBT”** (Sateia, Buysse, Krystal et al., 2017).

Skolnik, 2021

# AASM Behavioral Insomnia Guideline: 2021

- A guide for clinicians in choosing a specific behavioral and psychological therapy for the treatment of chronic insomnia disorder in adult patients.
- Each recommendation statement is assigned a strength (“strong” or “conditional”).
- A “strong” recommendation (“We recommend...”) is one that clinicians should follow under most circumstances.
- A “conditional” recommendation is one that requires that the clinician use clinical knowledge and experience, and to strongly consider the patient’s values and preferences to determine the best course of action.
- **We recommend that clinicians use multicomponent cognitive behavioral therapy for insomnia** for the treatment of chronic insomnia disorder in adults. (STRONG)
- We suggest that **clinicians *not* use sleep hygiene** as a single-component therapy for the treatment of chronic insomnia disorder in adults. (CONDITIONAL)



# CBT-I

- Included 87 randomized controlled trials, comparing 118 treatments (3724 patients) to non-treated controls (2579 patients).
- Overall, **the interventions had significant effects on: insomnia severity index, sleep efficiency, Pittsburgh sleep quality index, wake after sleep onset, sleep onset latency, number of awakenings and sleep quality.**
- **The results seem to be quite robust** (similar for patients with or without comorbid disease, younger or older patients, using or not using sleep medication).
- **We conclude that CBT-I is effective in the treatment of insomnia.**



# Cognitive Behavioral Therapy for Insomnia (CBT-I)

- **CBT-I is a treatment with moderate to large effects.**
- **These effects are believed to be sustained long-term.**
- **In this meta-analysis, we investigate long-term effects in 30 randomized controlled trials (RCTs) comparing CBT-I to non-active control groups.**
- **The primary analyses showed that CBT-I is effective at 3-, 6- and 12-months compared to non-active controls for insomnia severity index, sleep onset latency and sleep efficiency.**
- **CBT-I produces clinically significant effects that last up to a year after therapy.**

# Digital CBT (dCBT)

- Over the past decade, digital solutions have been developed to support the dissemination of CBT.
- In this paper, we review the evidence for and implications of digital CBT (dCBT) for insomnia.
- **Consistent evidence has been published on the effectiveness of dCBT to address insomnia disorder, in a variety of populations, with effects extending into well-being.**
- **Summary: The evidence base for dCBT is rapidly developing and already suggests that dCBT for insomnia is effective.**

Luik, Kyle & Espie, 2017

## Insomnia and Exercise

- Meta-analysis to assess the effects of **different regular exercise (lasting at least 2 months on a regular basis) on self-reported and physiological sleep quality in adults.**
- Varied exercise interventions contained traditional physical exercise (e.g., walking, cycling) and mind–body exercise characterized by gentle exercise with coordination of the body ( yoga)
- 22 randomized controlled trials were included in the analysis.

## Insomnia and Exercise (2)

- The overall analysis on subjective outcomes suggests that **exercise interventions significantly improved sleep quality in adults compared with control interventions.**
- Few significant effects were found in sleep parameters except the **increased sleep efficiency** in the exercise group vs. control group.
- Conclusions: **regular physical as well as mind–body exercise primarily improved subjective sleep quality rather than physiological sleep quality in adults.**
- Specifically, self-reported sleep quality, insomnia severity, and daytime sleepiness could be improved or ameliorated with treatment of exercise.

# Insomnia and Exercise (3)

- Previous researches have not investigated **the relationship between physical exercise (PE) intensity and sleep quality.**
- Systematic review aims to examine the effect **PE intensity on sleep quality in healthy populations.**
- Results: Fourteen studies were included in the review.
- Analyses revealed that moderate PE seems to be more effective than vigorous activity in improving sleep quality.
- Moderate physical exercise is beneficial to sleep quality in both young and old populations.
- Conclusions: **Moderate exercise showed more promising outcome on sleep quality than vigorous exercise.**

Wang & Boros, 2019

# Sleep Hygiene: Evidence Base

- The **ineffectiveness of sleep hygiene as a treatment** has raised questions.
- **Is there still a use for sleep hygiene?**
- The present review sought to evaluate the **empirical evidence for several common sleep hygiene recommendations, including regular exercise, stress management, noise reduction, sleep timing regularity, and avoidance of caffeine, nicotine, alcohol, and daytime napping.**
- Overall, though epidemiologic and experimental research generally supported an association between individual sleep hygiene recommendations and nocturnal sleep, **the direct effects of individual recommendations on sleep remains largely untested in the general population.**

# Treatment of Insomnia as Prevention for MDD

- **Older adults with insomnia have a high risk of incident and recurrent depression.**
- **Depression prevention is urgently needed**, and such efforts have been neglected for older adults.
- **Objective:** to examine whether treatment of insomnia disorder with CBT-I compared with an active comparator condition, sleep education therapy (SET), prevents major depressive disorder (MDD) in older adults.
- **DESIGN:** This assessor-blinded, parallel-group, single-site randomized clinical trial assessed a community-based sample of 431 people and enrolled 291 adults 60 years or older with insomnia disorder who had no MDD or major health events in past year, follow-up was 36 months.
- Participants were randomized to 2 months of CBT-I (n = 156) or SET (n = 135).

## Treatment of Insomnia as Prevention for MDD (2)

- **Remission of insomnia disorder** continuously sustained before depression event or during follow-up was **more likely in CBT-I participants** (26.3%) compared with the SET participants (19.3%).
- Those in the CBT-I group with sustained remission of insomnia disorder had an **82.6% decreased likelihood of depression** compared with those in the SET group without sustained remission of insomnia disorder.
- Conclusion: The findings indicate that **treatment of insomnia with CBT-I has an overall benefit in the prevention of incident and recurrent major depression in older adults with insomnia disorder.**
- **Community-level screening for insomnia concerns in older adults and wide delivery of CBT-I for insomnia could substantially advance public health efforts to treat insomnia and prevent depression in this vulnerable older adult population.**



# Public Health Approach: Sleep Health

- Sleep Health is a multidimensional pattern of sleep-wakefulness,
- adapted to individual, social and environmental demands,
- that **promotes physical and mental well being.**
- Good sleep health is characterized by **subjective satisfaction, appropriate timing, adequate duration, high efficiency and sustained alertness during waking hours** (Buysse, 2014).
- **Sleep quality assessments are an important early risk indicator and may reduce the incidence of a wide spectrum of morbidities** (Chattu, Manzar, Kumary et al., 2018).
- The Appendix includes the Sated Scale, a sleep health assessment.

# Main Points

- Sleep is a public health concern that intensified with COVID.
- Insomnia is prevalent among adults, usually chronic with multiple physical and mental health consequences.
- Cognitive Behavioral Therapy –Insomnia (CBT-I) is the first line treatment for chronic insomnia.
- Digital CBT-I can be effective as a stand alone treatment.
- Treatment of insomnia with CBT-I in older adults can prevent the onset of major depressive episodes.
- Pharmacological interventions for insomnia are evidence supported for only short term (less than 16 weeks) use with minimal harms data available and there is no data that pharmacological treatment of insomnia prevents the incidence of major depression or other mental health disorders.
- Sleep hygiene is not evidence based and is not recommended as a treatment for insomnia.

# Thank You

---

## Contact Us



 808-695-7700

 [www.beaconhealthoptions.com](http://www.beaconhealthoptions.com)



# Appendix



# Diagnostic Criteria for Insomnia DSM 5 and ICSD-3

A. A predominant complaint of dissatisfaction with sleep quantity or quality, associated with one (or more) of the following symptoms:

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.

B. The sleep disturbance causes clinically significant distress or impairment in social, occupational, educational, academic, behavioral, or other important areas of functioning.

C. The sleep difficulty occurs at least 3 nights per week

D. The sleep difficulty is present for at least 3 months.

E. The sleep difficulty occurs despite adequate opportunity for sleep.

## Diagnostic Criteria for Insomnia DSM 5 and ICSD-3 (2)

F. The insomnia is not better explained by and does not occur exclusively during the course of another sleep-wake disorder (e.g., narcolepsy, a breathing-related sleep disorder, a circadian rhythm sleep-wake disorder, a parasomnia).

G. The insomnia is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication).

H. Coexisting mental disorders and medical conditions do not adequately explain the predominant complaint of insomnia.

APA, 2013

# Sleep Hygiene: Good Habits, But Not Therapeutic



# SATED SCALE

Buyse, 2014

		Rarely/ Never (0)	Sometimes (1)	Usually/ Always (2)
<u>S</u> atisfaction	Are you satisfied with your sleep?			
<u>A</u> lertness	Do you stay awake all day without dozing?			
<u>T</u> iming	Are you asleep (or trying to sleep) between 2:00 a.m. and 4:00 a.m.?			
<u>E</u> fficiency	Do you spend less than 30 minutes awake at night? (This includes the time it takes to fall asleep and awakenings from sleep.)			
<u>D</u> uration	Do you sleep between 6 and 8 hours per day?			

Total for all for items ranges from 0-10

0=Poor Sleep Health

Good Sleep Health=10