Continuing Professional Development

CPD

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Breege is a member of the executive committee of The Irish Sleep Society, a member of AASM (American Academy of Sleep Medicine) and the Society of Behavioural Sleep Medicine. Breege is a Board Member of The British Society of Pharmacy Sleep Services (BSPSS).

## 60 Second Summary

Despite increased awareness on the importance of sleep, many people with sleep disorders do not seek help from a physician for the diagnosis or management of the disorder and many even choose to self-medicate. This results in many sleep disorders remaining undiagnosed and untreated.

Sleep is a complex amalgamation of physiological and behavioural processes. Human physiology and health rely on daily circadian rhythms (circa diem, period of about 24 hours). This circadian time keeping system or 'master clock' is known as the suprachiasmatic nucleus (SCN) and is located in the hypothalamus.

Insomnia disorder has a prevalence of between 6% and 20%. This increases to between 30% and 48% of the general population at a symptom level. Being older, female, or being from a socioeconomic background are independent risk factors for the development of insomnia. Having a previous episode of insomnia also increases the risk of a future episode.

Within sleep there are two separate states, rapid eye movement (REM) and non-rapid eye movement (NREM). NREM is subdivided into 3 stages, NI, N2 and N3. These stages are determined by electroencephalography (EEG).

Restless legs syndrome (RLS) is a neurological sleep disorder. It is also called Willis-Elbom disease (WED). Prevalence of RLS ranges from 0.6% to 15% of the population. This increases to 27% in pregnant females.

Obstructive sleep apnea syndrome is the most common respiratory disorder of sleep with a prevalence of at least 4% in the general population, and twice as common in males as females.

**1. REFLECT -** Before reading this module, consider the following: Will this clinical area be relevant to my practice?

**2. IDENTIFY -** If the answer is no, I may still be interested in the area but the article may not contribute towards my continuing professional development (CPD). If the answer is yes, I should identify any knowledge gaps in the clinical area.

**3. PLAN -** If I have identified a knowledge gap - will this article satisfy those needs - or will more reading be required?

**4. EVALUATE -** Did this article meet my learning needs - and how has my practise changed as a result? Have I identified further learning needs?

**5. WHAT NEXT -** At this time you may like to record your learning for future use or assessment. Follow the 4 previous steps, log and record your findings.

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# Improving the Management of Sleep Disorders in the Community Pharmacy Setting

Despite increased awareness on the importance of sleep, many people with sleep disorders do not seek help from a physician for the diagnosis or management of the disorder and many even choose to self-medicate. This results in many sleep disorders remaining undiagnosed and untreated. Studies showed that mental health problems, such as depression, anxiety, insomnia, and post-traumatic stress disorder (PTSD) have dramatically increased during the COVID-19 pandemic. With continued pressure on all health services the need for early intervention has never been greater. Early recognition and treatment of common sleep disorders help minimise significant health, social and fiscal consequences. Community pharmacy is recognised as a valuable and trusted public health resource which delivers several preventative and public health programmes. Despite this, sleep services remain poor. The British Society of Pharmacy Sleep Services (BSPSS) was founded in 2021 to 'advance Public Health through better sleep; at the first healthcare professional / patient interaction: when a patient (or their partner) consults a pharmacist.' A recent study by BSPSS showed that proposed pharmacist involvement in sleep screening/signposting services or a pharmacy-based intervention/ referral programme was supported by 78% and 70% respectively.

### The Sleep Cycle

Sleep is a complex amalgamation of physiological and behavioural processes. Human physiology and health rely on daily circadian rhythms (circa diem, period of about 24 hours). This circadian time keeping system or 'master clock' is known as the suprachiasmatic nucleus (SCN) and is located in the hypothalamus. This time keeping system is finely regulated by a complex interaction between two processes, the homeostatic system (process S) and an intrinsic 24-hour rhythm driven by the circadian pacemaker (process C). Process S represents sleep debt which rises during wake and declines during sleep. It also depends on prior duration of sleep and wakefulness. Process C is the regulation of the body›s internal biological processes e.g., core body temperature and melatonin.

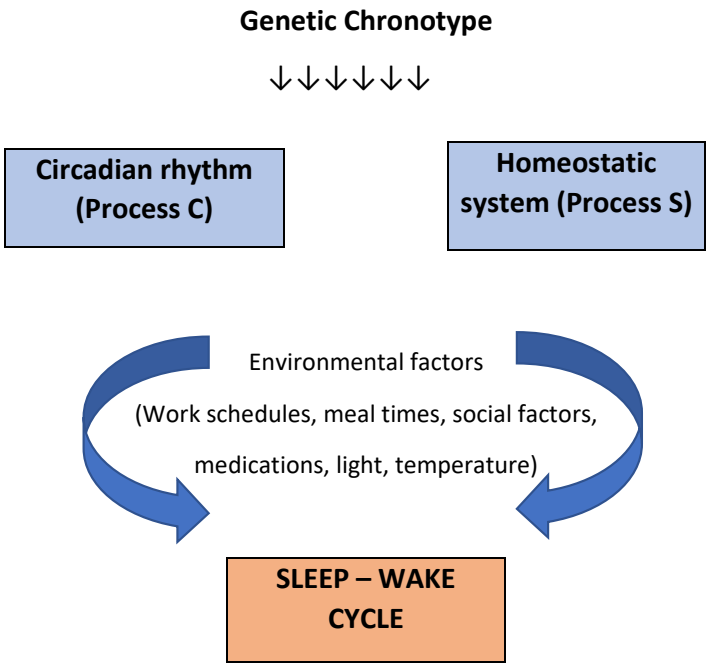


Figure 1. The Sleep Wake System

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The sleep-wake rhythm is entrained through photic and non-photic 'Zeitgebers' (time givers) to the 24-hour solar day. The most potent zeitgeber being light, providing direct information about the 24-hour solar day to the hypothalamus via the retina of the eye.

An individual's chronotype will also influence the circadian phase. Circadian clocks differ between individuals.

Timing, duration and structure of sleep depends on the interaction of the two systems. Alteration of the synchronization between these two systems may lead to sleep disturbances and may have an involvement in the pathophysiology of several diseases.

**Sleep architecture**

Within sleep there are two separate states, rapid eye movement (REM) and non-rapid eye movement (NREM). NREM is subdivided into 3 stages, NI, N2 and N3. These stages are determined by electroencephalography (EEG). In NREM sleep EEG characteristics include sleep spindles, K complexes and high voltage slow waves. REM is defined by fast EEG activity, muscle atonia and episodic bursts of rapid eye movements.

The normal adult enters sleep through NREM sleep, NI which is a transitional stage of sleep. Normal latency to N1 is approximately 20 minutes. Sleep is easily discontinued during this stage as it is a very light stage of sleep. Only about 5% of the night sleep should consist of N1 sleep.

N2 sleep consists of sleep spindles and K complexes in EEG and will continue for approximately the next 10 to 25 minutes. N2 makes up approximately 50% of the night's sleep. As this stage progresses slower EEG activity occurs as N3 is entered. N3 is also referred to as deep sleep, delta sleep or slow wave sleep. The overall night's sleep should consist of about 20% N3 sleep. This is a very stable stage of sleep, and a large stimulus is needed to wake the individual. Wakes from this stage of sleep can leave the individual groggy and disorientated for a time. A very brief period of light sleep (N1 and N2) can follow before entering into the first period of REM sleep at about 90 minutes after sleep onset. During REM sleep there is fluctuations in blood pressure and heart rate, irregular respiration and muscle atonia and one dreams. REM sleep makes up approximately 20 – 25% of the night's sleep.

NREM and REM sleep continue to alternate in cyclic episodes throughout the night in 90 minutes cycles. N3 mostly occurs in the first third of the night REM episodes become longer as the night progresses. (However, this will be altered in the case of sleep deprivation).

While there are recommended guidelines, the length of nocturnal sleep depends on many factors including age, prior sleep, circadian rhythms, medications, environmental factors and presence of sleep disorders.

**Insomnia**

Insomnia disorder has a prevalence of between 6% and 20%. This increases to between 30% and 48% of the general population at a symptom level. Being older, female, or being from a socioeconomic background are independent risk factors for the development of insomnia. Having a previous episode of insomnia also increases the risk of a future episode.

Three classification systems exist for the definition of insomnia, International Classification of Diseases (ICD), Diagnostic and Statistical Manual of Mental Disorders (DSM) and International Classification of Sleep Disorders (ICSD). In 2017 European guidelines for the diagnosis and treatment of insomnia were published by a task force of the European Sleep Research Society (ESRS). The guidelines rely on insomnia as defined by ICD-10/ ICSD-3 and primarily targets insomnia as an independent disorder.

*Acute Insomnia:* There is no consistent definition of acute insomnia but the episode should meet all the criteria for Insomnia Disorder except duration. Acute insomnia can last from days to weeks and is very common. Due to its short nature medical intervention is not needed. The pharmacist can play a vital role in the prevention of a chronic insomnia at this point. Intervention with sleep education and basic sleep hygiene tips can help avoid an acute episode developing into a chronic insomnia disorder. With acute insomnia an obvious stressor is usually easily identifiable and sleep will usually return to normal once the stressor has dissipated. Over the counter medication (OTC) may be considered when deemed appropriate by the pharmacist at this early point. Diphenhydramine hydrochloride is an antihistamine which is an aid to relieve temporary sleep disturbances in adults and can be used up to 7 days.

*Chronic Insomnia:* The diagnosis for insomnia must meet all criteria as set out in Figure 2. Treatment at this point should involve evidence-based, first line treatment, Cognitive Behavioural Therapy for Insomnia (CBT-I). Insomnia can often arise from psychological factors, maladaptive behaviours, dysfunctional thinking about sleep and its consequences and CBT-I addresses all these factors. It should be administered by a trained health care professional and include several treatment sessions. Elements of the CBT-I programme involve sleep education, stimulus control therapy, relaxation therapy, sleep restriction therapy, cognitive strategies as well as prevention techniques.

Pharmacological treatment for insomnia should be limited to short term use only, if CBT-I is unavailable or if a patient does not respond to CBT-I. Available substances that are commonly used include benzodiazepines (BZ), benzodiazepine receptor agonists (BZRA), antidepressants, anti-psychotics, antihistamines, phytotherapeutic substances and melatonin. A variety of side-effects of hypnotics have been reported, including hangover, nocturnal confusion, falls, rebound insomnia, tolerance and dependency. In older adults there is nearly a 5-fold increased risk of adverse cognitive events associated with their use. Despite this it appears that the use of hypnotic agents has increased significantly over a 10-year period according to a study by Pallesen et al.

All medications prescribed for sleep disturbances should be monitored carefully and assessed for any emergence of adverse side effects. Some medications may precipitate new or exacerbate co-existing sleep related problems

| | |
|---|---|
| **A.** | **The patient reports, or the patient's parent or caregiver observes, one or more of the following:** |
| | **1. Difficulty initiating sleep.** |
| | **2. Difficulty maintaining sleep.** |
| | **3. Waking up earlier than desired.** |
| | **4. Resistance to going to bed on appropriate schedule.** |
| | **5. Difficulty sleeping without parent or caregiver intervention.** |
| **B.** | **The patient reports, or the patient's parent or caregiver observes, one or more of the following related to the night-time sleep difficulty:** |
| | **1. Fatigue/malaise.** |
| | **2. Attention, concentration or memory impairment.** |
| | **3. Impaired social, family, occupational or academic performance.** |
| | **4. Mood disturbance/irritability.** |
| | **5. Daytime sleepiness.** |
| | **6. Behavioural problems (e.g., hyperactivity, impulsivity, aggression).** |
| | **7. Reduced motivation/energy/initiative.** |
| | **8. Proneness for errors/accidents.** |
| | **9. Concerns about or dissatisfaction with sleep.** |
| **C.** | **The reported sleep/wake complaints cannot be explained purely by inadequate opportunity (i.e., enough time is allotted for sleep) or inadequate circumstances (i.e., the environment is safe, dark, quiet and comfortable) for sleep.** |
| **D.** | **The sleep disturbance and associated daytime symptoms occur at least three times per week.** |
| **E.** | **The sleep disturbance and associated daytime symptoms have been present for at least 3 months.** |
| **F.** | **The sleep/wake difficulty is not better explained by another sleep disorder.** |

Figure 2. The Diagnostic criteria for chronic insomnia disorder according to ICSD-3

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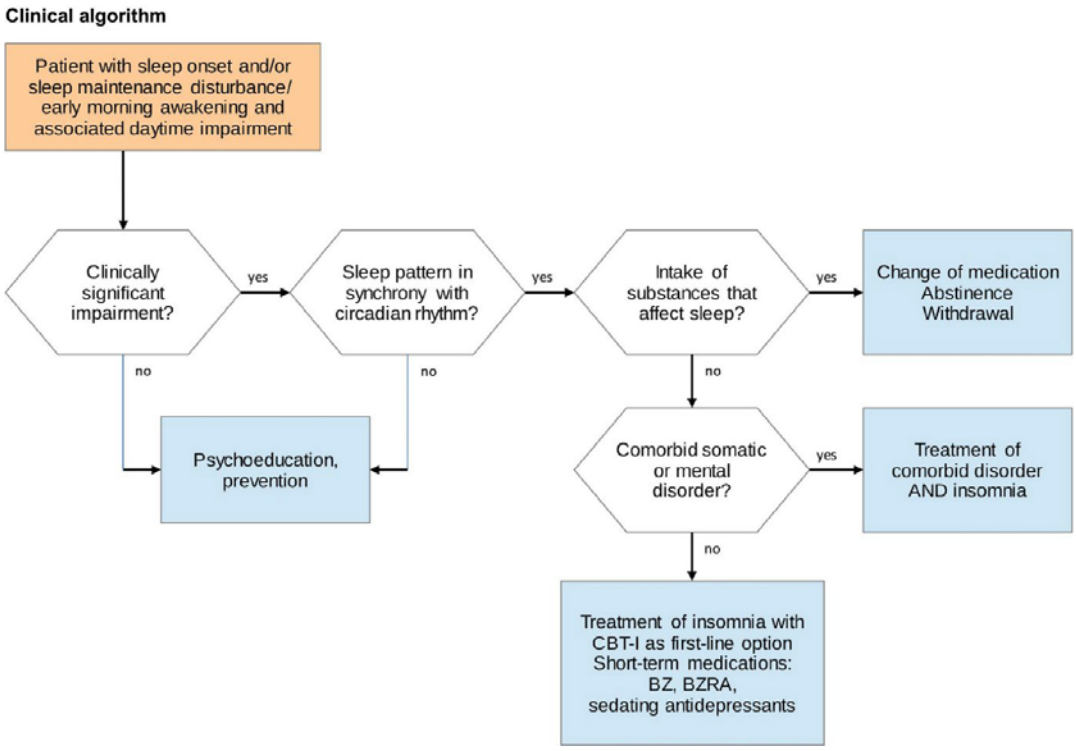


Figure 3. Clinical algorithm for the diagnosis and treatment of insomnia

Adapted from 'European guideline for the diagnosis and treatment of insomnia J Sleep Res. (2017) 26, 675–700'

e.g., daytime sleepiness, sleepwalking. For example, when REM-supressing medications are abruptly withdrawn, an increase in nightmares may be seen as a result of a subsequent REM sleep rebound. Patients should always be made aware of potential interactions with other medications and OTC medications they may be prescribed and the possibility of exacerbation of underlying medical conditions.

**Restless Legs Syndrome**

Restless legs syndrome (RLS) is a neurological sleep disorder. It is also called Willis-Elbom disease (WED). Prevalence of RLS ranges from 0.6% to 15% of the population. This increases to 27% in pregnant females. The disorder is defined by the classic clinical symptoms of an overwhelming urge to move the legs while resting in the evening and night. This is accompanied by an uncomfortable/unpleasant sensation in the legs with patients often describing it as a crawling sensation. Symptoms are partially or totally relieved by walking or stretching the legs. Symptoms may return as soon as the movement stops, particularly in severe cases. RLS can be primary or secondary. Primary can be sporadic or have a positive family history. Secondary RLS is mainly associated with conditions linked to iron deficiency including pregnancy, anaemia, end stage renal disease and even frequent blood donations.

Many studies have demonstrated that sleep disturbances are a key consequence, and often the most troublesome symptom of RLS. Thus, sleep problems are commonly reported by patients with both primary and secondary RLS.

The disorder can also include the arms and other parts of the body, particularly in more severe cases.

The primary motor sign of RLS is period limb movement during sleep (PLMS). These are repeated leg movement which occur every 20 to 40 seconds during NREM sleep. PLMS are noted in 80% of patients with RLS.

Diagnosis of RLS is based on clinical evaluation of symptoms.

**Treatment**

Nonpharmacological: Good sleep hygiene is advised and alcohol should be avoided in the evening as it can aggravate symptoms.

Pharmacological: Moderate to severe RLS treatment generally involves four categories of medications; dopaminergic agents, alpha-2-delta ligands, opioids and benzodiazepines. All pharmacological treatments are palliative and occasional drug holidays should be considered to assess the need for continuing treatment.

Iron treatment should be considered for all RLS patients according to the International Restless Legs Syndrome Study Group (IRLSSG) task force report.

**Obstructive Sleep Apnea Syndrome (OSAS)**

Obstructive sleep apnea syndrome is the most common respiratory disorder of sleep with a prevalence of at least 4% in the general population, and twice as common in males as females. It is a complex disorder characterised by brief interruptions in breathing which are a result of mechanical factors that increase the collapsibility of the upper airway. The most common associated nocturnal symptoms include snoring, gasping or choking, witnessed apneas, nocturia, frequent awakenings, enuresis and nightmares. Daytime symptoms include waking up with a dry mouth, morning headaches, reflux, excessive day time sleepiness (EDS) and personality/ mood changes.

OSA is an independent major risk factor for a number of associated medical conditions, majority being cardiovascular disease including hypertension, myocardial infarction, congestive heart failure, atrial fibrillation and stroke. It is also a risk factor for depression, type 2 diabetes and road traffic accidents (RTAs).

While screening questionnaires and clinical history is useful, diagnosis needs to be made for a formal sleep study (nocturnal polysomnography or ambulatory).

Diagnosis of OSA is graded on a scaling basis using Apnea Hypopnea Index (AHI). AHI is defined as the number of apneas/ hypopneas per hours of sleep (as per polysomnography or ambulatory study).

- AHI 5 – 14 = Mild OSA
- AHI 15- 29 = Moderate OSA
- AHI > 30 = Severe OSA.

Large neck size (17 inches in men, 16 inches in women)

Obesity (body mass index >30)

Facial abnormality (retrognathia, midface abnormalities)

Narrowed upper airway (very large tonsils)

Male gender ↑ risk

Postmenopausal women ↑ risk

Figure 4. Classic signs of Obstructive sleep apnea syndrome

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**Treatment**

Adverse consequences of untreated OSA pose an enormous health risk and effective treatment involves a skilled, patient centred, long term management and adherence of therapy. The therapy of choice is Continuous Positive Airway Pressure (CPAP). CPAP therapy was initially prescribed by Sullivan and colleagues in 1981. CPAP blows pressurised air either through the nose and /or mouth via a well-fitting and comfortable mask. This pressurised room air acts as a pneumatic splint that maintains the patency of the upper airway. Initiation and prescription of CPAP is done through in house monitoring to ensure adequate pressure requirements are met to resolve all signs and symptoms of OSA.

Other treatments include mandibular advancement devices (MAD) which are designed to improve airway patency by positioning the lower jaw in an anterior and inferior position. They are only recommended after consultation with a sleep physician to assess suitability post medical diagnosis and usually only indicated for mild OSA or snoring.

Bariatric surgery can be a potential management option in severely obese patients with OSA. This should only be performed in specialised centres with expertise in the surgical and anaesthetic management of these patients.

Patient education, good sleep hygiene as well as behavioural modifications (e.g., weigh loss, use of alcohol, avoidance of sleeping medications) should also be an integral part of treatment.

**Sleep Diary**

A sleep diary is an easy achieved assessment tool that provides a daily record of a patient's perception of their sleep. (They can also be used to monitor progress after intervention). They are inexpensive and easy to complete. They consist of blocks of time slept over cycles of 24 hours. They gather subjective data on sleep timing, routines, quality of sleep etc. There are many published versions and one of the most common versions has been published by the American Academy of Sleep Medicine (AASM) and is readily available online.

**Questionnaires**

Evidence-based patient questionnaires can be used to help guide the pharmacist as to the nature of the sleep disturbance. Some of the most popular and most beneficial include:

*Insomnia Severity Scale (ISS):* Designed to assess the nature, severity, and impact of insomnia. It can also be used to monitor treatment response in adults. Scores range from 0 to 28. 0–7 = No clinically significant insomnia 8-14 = Subthreshold insomnia. 15-21 = Clinical insomnia (moderate severity). 22-28 = Clinical insomnia (severe).

*Epworth Sleepiness Scale (ESS):* This is used to estimate the level of excessive daytime sleepiness (EDS) by assessing the sleep propensity in 8 daily situations. Scores range from 0 (no chance of dozing) to 3 (hight probability of dozing). Total score ranges from 0 to 24. Scores of 0-5 lower = normal daytime sleepiness. 6-10 = normal daytime sleepiness. 11-12 = mild EDS. 13 -5 = moderate EDS. 16-24 = severe EDS. This scale can be useful if there is a suspicion of OSA.

*Stanford Sleepiness Scale (SSS):* This is a subjective measure of sleepiness. It consists of 7 levels of vigilance from complete wakefulness to falling asleep. It evaluates the level of sleepiness at specific moments in time. The higher the score the higher the level of sleepiness. A score above 3 is considered sleepy.

*RLS Screening Questionnaire (RLSSQ):* The RLSSQ is a 10-item patient self-rating instrument assessment of the patient's symptoms with short questions that have to be answered by either yes or no with points being allocated. The severity of RLS is defined as follows; Scores range from 0 to 40. < 1 = none. 1-10 = Mild. 11-20 = Moderate. 21- 30 = Severe. 31-40 = Very Severe. Patients must meet International Restless Legs Syndrome Study Group (IRLSSG) criteria for the diagnosis of restless legs syndrome (RLS).

*STOP and STOP-Bang Questionnaire (STOP):* It consists of eight dichotomous, yes/no items related to the clinical features of OSA. The total score ranges from 0 to 8. Patients can be classified for OSA risk based on their respective scores. 0-2 = low risk of moderate to severe sleep apnea. 3-4 = midrange and needs further investigation for classification. 5-8 = high risk of moderate/severe OSA.

*Pittsburgh Sleep Quality Index:* The PSQI is a self-rated questionnaire which assesses sleep quality and disturbances over a 1-month time interval. Nineteen individual items generate seven component scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. The sum of scores for these seven components yields one global score (range 0 to 21). Higher scores indicate worse sleep quality.

*Beck›s Depression Inventory:* This questionnaire is a 21-item, self-report rating inventory that measures characteristic attitudes and symptoms of depression. 1-10 = These ups and downs are considered normal. 11-16 = Mild mood disturbance. 17-20 = Borderline clinical depression. 21-30 = Moderate depression. 31-40 = Severe depression. Over 40 = Extreme depression.

**Sleep Education and Sleep Hygiene**

A starting conversation around sleep can uncover and address any unhealthy sleep practices that may be present. Healthy sleep practices, known as sleep hygiene include limiting caffeine products, structured meal times, exercise, avoiding phone use in the lead up to bedtime and addressing the bedroom environment ensuring its cool, dark, quiet. These behaviours aim to avoid activities that may disrupt sleep and create a sleep environment conductive to sleep. There is no standard definition of sleep hygiene.

Many people have unrealistic expectations of sleep and managing these expectations by proper evidence-based sleep education can be hugely beneficial at relieving some of the anxiety around sleep. Having a better understanding of basic sleep biology enables behavioural changes to be become more achievable. It is also important to ensure that the patients realises that sleep hygiene alone will not improve any chronic sleep disorder and they must be advised to seek further medical advice to ensure proper diagnosis and treatment.

**Sleep and Mental Health**

A stable circadian rhythm and an optimal amount of sleep are important factors for mental wellbeing. There is mounting evidence that sleep and circadian functioning is an import factor in influencing onset and trajectory of a variety of mental health disorders. In a meta-analysis, Baglioni et al. (2011) showed that people with insomnia have an increased risk for the development of major depressive disorder (odds ratio 2.1). Several other studies have shown similar relationships with insomnia complaints and suicide, suicide ideation, suicide attempts and completed suicides.

Despite the common co-occurrence the nature of the sleep and mental health relationship is not well understood. Regardless of this it is imperative to take into consideration sleep characteristics when planning treatment of mental disorders. Recognition of pharmacological consequences on sleep and circadian rhythm should be taken into account when combining dosing and timing. Sleep characteristic should continue to be monitored as they can be predictive of a new disease episode.

It is not surprising that a global pandemic like COVID-19 will cause unprecedented changes in our lives, as sleep disturbances are an obvious response to this major stressful event. A study by Lin and colleagues in 2020 revealed very high rates of clinically significant insomnia (20%), acute stress (15.8%), anxiety (18.5%), and depression (24.5%) as a result of the early impact of COVID-19 on sleep and mental health. The data suggested a 37% increase in the rates of clinical insomnia (from 14.6% to 20%) from before to peak of the COVID pandemic. The study highlights the need for rapid interventions to help people cope during periods of crisis. This is where pharmacists can play a critical role in administering sleep education and sleep hygiene as well as assessment of suitability of short-term OTC use.

**References available upon request**

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