

Table 7.1 Caffeine content of commonly consumed food and drinks

Beverage	Caffeine content (mg/ml of beverage or mg/g or food)
Coffee	0.2–2.1 mg/ml
Decaffeinated coffee	0.01 mg/ml
Black tea	0.2 mg/ml
Green tea	0.1 mg/ml
Decaffeinated tea	0.01–0.06 mg/ml
Cola	0.1–0.19 mg/ml
Energy drinks	0.11–0.68 mg/ml
Chocolate	0.2–0.7 mg/g
Cocoa or chocolate milk	0.01–0.07 mg/ml

Note: These values are approximate and will vary widely. Total caffeine consumption can be calculated by multiplying the concentration of the caffeine in each substance by the quantity of the substance consumed (Bazalakova and Benca 2017; Chin et al. 2008; Mitchell et al. 2014).

caffeinated substances they consume and at what time. As many patients are unaware that caffeine is found in green tea, some herbal teas, some soft drinks and sports drinks, etc., one should either ask them to describe everything they drink throughout the day or ask specific questions about all the common caffeinated foodstuffs (Table 7.1).

The stimulant effect of nicotine is under-recognized, and many patients will smoke immediately prior to bed in order to relax. The total amount and timing of nicotine-containing products should be ascertained. Similarly, patients may consume alcohol, marijuana or other sedative substances to aid their sleep. Once again the timing of these substances is as important as their quantity. For example, a patient who drinks throughout the day will require a very different approach from one who drinks at night only in order to induce sleep. The former patient is more likely to be dependent on alcohol and to be drinking for reasons other than insomnia, and their drinking may need to be addressed before the insomnia can be treated. The latter patient may be using alcohol to self-medicate for the insomnia, and providing alternative strategies to manage the insomnia may be the focus of their treatment.

7.4 Physical Examination and Investigations

Physical examination is rarely needed in the assessment of insomnia unless the history raises the possibility of specific conditions such as hyperthyroidism or obstructive sleep apnoea. Similarly, blood tests are rarely required unless one is concerned about poor kidney or liver function which may affect your choice and dose of medication. The exception to this is where you suspect the insomnia may be secondary to restless legs and periodic limb movements. In that case ferritin, folate, vitamin B12, kidney function and blood glucose tests are worth performing in order to look for any biochemical causes of the movement disorder. An electrocardiogram is

warranted if one is considering treating the insomnia with drugs that can prolong the QTc interval.

Polysomnography (PSG) is not indicated for the routine assessment of insomnia, including insomnia in the context of other psychiatric disorders (Littner et al. 2003). PSGs are helpful if you suspect another underlying sleep disorder, particularly periodic limb movements or obstructive sleep apnoea. They may also be useful in patients who are very poor historians, and it is not possible to exclude other sleep disorders or quantify their sleep on the history alone. Finally, a PSG can be helpful in cases of paradoxical insomnia, especially if the patient believes they do not sleep at all. In these cases, the PSG fulfils two functions. Firstly, it allows the clinician to garner information about the patient's objective sleep time, albeit on a single night, which can be useful in planning behavioural treatments. Secondly, for some patients with paradoxical insomnia, it can be very therapeutic to see that they are in fact sleeping. However, it should be noted that some patients will be incensed by the evidence of their sleep state misperception and will not believe that the PSG they are seeing is their own and this may damage the therapeutic relationship. It may be helpful to explain to patients before their study how the PSG works, how different sleep stages are identified on the PSG, etc.

Actigraphy, which utilizes an accelerometer worn on the wrist to monitor movement and sleep-wake patterns, is also not routinely used for insomnia assessment (Schutte-rodin et al. 2017). Actigraphy may not be particularly accurate in the insomnia population though it is probably not any less accurate than sleep diaries (Tryon 2004). However, actigraphy may be useful if patients are unable to keep a sleep diary or you suspect that their sleep diary is not a good reflection of their sleep pattern. It is also a helpful investigation if one suspects that the patient has a circadian rhythm disorder.

7.5 Formulation of the Insomnia

A thorough history will give a rich picture of the patient's condition, the factors that contribute to their insomnia and the obstacles to improvement. In order to condense this information into a formulation that captures the most important factors and informs one's treatments, it can be helpful to conceptualize the factors affecting a patient's sleep using six categories as shown in Fig. 7.1.

7.5.1 Homeostatic Factors

This corresponds with Process S in the two-process model of sleep. It can be helpful to think about the homeostatic sleep drive as the fuel that drives our sleep. Put simply, during wakefulness we accumulate sleepiness, and we use that sleepiness to drive our sleep. In order to sleep well at night, we need to accumulate sufficient sleepiness during the day. A good history of the typical night and daytime behaviours will establish if this is happening. Patients who go to bed too early are likely

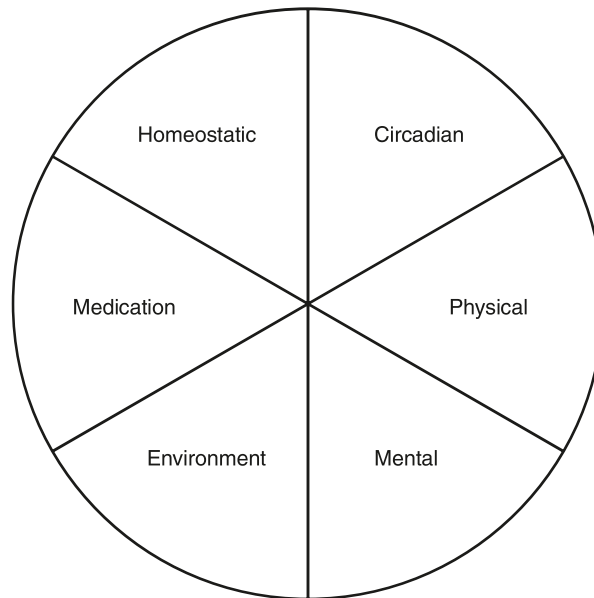


Fig. 7.1 Six factors contributing to insomnia

to be trying to sleep before they have accumulated sufficient sleepiness. Daytime naps (deliberate or unintended) use up some of the accumulated sleepiness and make it harder to initiate and maintain sleep at night. Irregular waking times mean that the patient is starting to accumulate sleepiness at a different time every morning, and so the time when they have enough sleepiness to initiate consolidated sleep will be different every night leading to chaotic sleep patterns. If these homeostatic factors are present, one should ensure the patient keeps a constant rising time, avoids napping and delays their bedtime until they have accumulated sufficient sleepiness. This is discussed in more detail in the chapter on cognitive behaviour therapy for insomnia.

7.5.2 Circadian Factors

This corresponds to Process C in the two-process model. This is obviously important in circadian rhythm disorders but also plays a role in insomnia. Our internal body clock drives our innate alertness drive. Broadly speaking, this innate drive progressively increases alertness throughout the day in order to offset the accumulating sleepiness. The alerting drive peaks at around 9 p.m. and then starts to drop. Once it has dropped sufficiently, it is no longer able to offset the sleepiness, and we fall asleep. The alertness drive reaches its nadir in the early hours of the morning. Once again, the description of a typical night will reveal whether the circadian cycle is being utilized optimally by the patient. Patients who try to initiate sleep too early

in the evening will be trying to fall asleep when the alertness drive is too high. Conversely, patients who work night shifts may be trying to stay awake when the alertness drive is low but battle to sleep in the day when the alertness is increasing. As light is the most important factor (*zeitgeber*) synchronizing the body clock with the outside world, irregular waking hours and lack of exposure to daylight may weaken the circadian signal.

If these factors are playing a role, then one might concentrate on adjusting sleep times to better fit the circadian drive, strengthening the *zeitgebers* particularly by using light exposure, advising on optimal ways to schedule shifts and prescribing carefully timed melatonin.

7.5.3 Physical Factors

This refers to physical conditions that may impact on sleep. Physical factors that may adversely impact on sleep include restless legs, obstructive sleep apnoea, pain, hyperthyroidism, gastro-oesophageal reflux and asthma (which is often worse at night). On the other hand, exercise is a physical factor that can be beneficial to sleep. Clearly, if these factors are driving the insomnia, optimizing their treatment will be an important part of the treatment plan.

7.5.4 Mental Factors

These can be acute or chronic. Acute factors are time-limited and may vary from night to night, such as short-term stress, excitement, anger, contentment, etc. Chronic factors refer to longer term psychiatric illnesses and stable personality traits. It also includes learned anxiety about sleep itself and unhelpful cognitions around sleep. Many of the techniques in cognitive behaviour therapy for insomnia (and CBT in general) as well as relaxation techniques and mindfulness help patients to better manage these factors and, of course, psychiatric interventions are essential in improving the long-term mental factors.

7.5.5 Environmental Factors

Light, noise, room temperature, bed comfort, safety, etc. are obviously important. This is often the most difficult area for clinicians to alter. However, this category also includes whether the environment is being used in an appropriate way. Patients who use their beds and bedrooms for waking activities such as work, studying, eating or watching TV will come to associate the bed environment with wakefulness rather than sleep. Thus, for many patients with insomnia, the act of going to bed wakes them up. By banning these activities in the bedroom and

avoiding spending any time in bed awake one can gradually change this conditioned association so that the bed becomes associated with sleep, and the act of going to bed induces sleep.

7.5.6 Medication

There are three aspects to the medication domain. The first is the impact of medications prescribed for other conditions such as hypertension, pain or psychiatric conditions. Many of these medications can have deleterious or beneficial effects on sleep. At times, the prescriber may have chosen the particular medication with its effects on sleep in mind, but more commonly any effects on sleep are unintended. Advising on alternative medications and judicious timing of medications allows one to minimize the impact of medications that adversely affect sleep and take advantage of any beneficial effects. The second aspect is the use of medications specifically prescribed for sleep which include hypnotics, medications to treat restless legs, melatonin and stimulant medications. One needs to determine how effective these treatments are, consider their side-effect/benefit ratio and record any concerns about inappropriate medication use. The third aspect to consider is the use of caffeine, nicotine, drugs and alcohol and their impact on sleep.

This system not only allows one to organize the information gathered in the history and investigations in a coherent and comprehensive manner but, if borne in mind while taking the history, acts as an effective aide-memoire to ensure that all areas of the history are covered. Finally, it encourages the clinician to formulate a holistic treatment plan for the insomnia that addresses as many of the contributory factors as possible.

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