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Are you an owl or a lark?

The Importance of Sleep in Diabetes Control

Sleep is essential for overall health and well-being, as it influences a wide range of physiological and cognitive processes. In recent years, research has highlighted the interrelationship between sleep and various chronic conditions, including type 2 diabetes

mellitus (T2DM). T2DM is a chronic disease characterized by hyperglycemia resulting from a deficiency in insulin secretion or its effective action. Factors such as sleep quality and chronotype can play a significant role in the development and management of diabetes.¹

DIABETES AND SLEEP QUALITY

Sleep quality refers to the subjective perception of having had restorative sleep, which includes factors such as duration, continuity, and depth of sleep. In individuals with T2DM, it has been observed that poor sleep quality may contribute to increased insulin resistance, leading to higher glucose levels. Additionally, there has been an increase in appetite, which leads to greater caloric intake and a higher risk of obesity². Various studies have shown that sleep fragmentation and sleep disorders, such as obstructive sleep apnea, are common in individuals with diabetes¹.

On the other hand, insufficient sleep duration has also been linked to a higher risk of developing T2DM. Sleep deprivation can alter glucose metabolism and increase cortisol levels, which predisposes individuals to hyperglycemia. As noted in a study by Knutson et al., adults who slept less than 6 hours per night had a significantly higher risk of developing T2DM vs those who slept between 7 and 8 hours³.

SLEEP DISORDERS AND DIABETES

There is a direct relationship between certain sleep disorders and diabetes, such as in the case of obstructive sleep apnea (OSA).

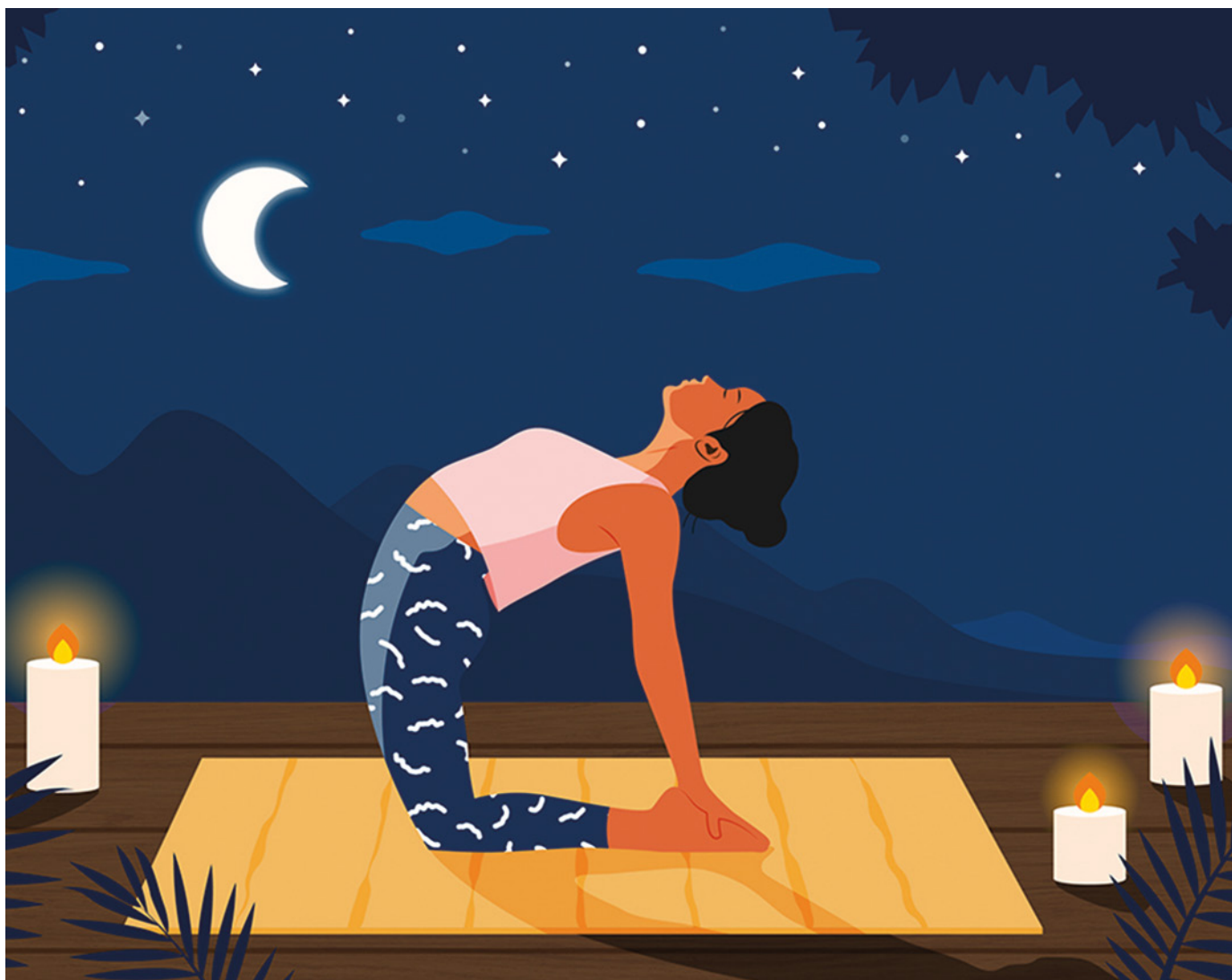
OSA is a disorder characterized by repeated pauses in breathing during sleep, leading to sleep fragmentation and decreased oxygen levels. The prevalence of OSA is high in patients with T2DM and has been associated with poor glycemic control and an increased risk of cardiovascular complications. Treatment of OSA with continuous positive airway pressure (CPAP) therapy can improve not only sleep quality but also glucose levels.

A study by Marin et al. showed that men with untreated OSA have a higher risk of long-term cardiovascular complications vs those who received CPAP treatment. This finding highlights the importance of early diagnosis and the proper treatment of sleep disorders in patients with T2DM⁴.

CHRONOTYPE AND DIABETES

Chronotype is defined as the description of individual preferences for daytime or nighttime activities, and it may also influence the risk and management of T2DM. Evening »





» chronotypes, who prefer nocturnal activities, tend to go to bed and wake up late. They have been associated with worse metabolic profiles and a higher risk of developing diabetes. This is partly because evening chronotypes tend to have less healthy lifestyles, such as poor diets and lower physical activity, contributing to obesity and, consequently, higher insulin resistance¹².

Additionally, the misalignment between the internal biological rhythm and social timing is more prevalent in evening chronotypes and can exacerbate metabolic problems, as demonstrated by the study of Vetter *et al.*⁵.

Evening chronotypes tend to consume more calories in the afternoon and evening, which can lead to higher glucose spikes after meals. Furthermore, these individuals often have less time for physical activity due to their later schedules, which can further reduce insulin sensitivity².

Adjusting meal times and physical activity according to chronotype may be an effective strategy to improve glycemic control. Morning chronotypes may benefit from an early and nutritious breakfast, while evening types might need adjustments in their meal and exercise schedules to avoid nocturnal glucose spikes.

Planning a regular sleep schedule may also help regulate the circadian rhythm and improve glucose metabolism.

RECOMMENDATIONS FOR IMPROVING SLEEP

In the treatment of T2DM in patients with sleep problems and evening chronotypes, an integrated approach combining pharmacological and non-pharmacological interventions may be beneficial.

Benzodiazepine and non-benzodiazepine hypnotics can be helpful in improving sleep quality in some patients, but they »

TABLE 1

Maintain a regular sleep schedule.
Create a comfortable sleep environment.
Exercise regularly, but not within 3 hours before bedtime.
Avoid stimulants, caffeine, tobacco, and alcohol.
Limit exposure to blue light from electronic devices at least 2 hours before bedtime.

» must be used cautiously due to potential side effects and dependence.

Cognitive behavioral therapy has proven effective in improving sleep quality and could be an option to consider for these patients⁶.

In addition to the above-mentioned interventions, there are several non-pharmacological strategies that can be implemented to improve sleep quality and diabetes management in patients with different chronotypes:

Sleep Hygiene

Promoting sleep hygiene can help improve sleep quality in patients with T2DM⁷ (Table 1).

Physical Activity

Regular physical activity is crucial for the

management of T2DM. Exercise not only improves insulin sensitivity but also promotes better sleep¹⁻⁹.

Stress Management

Chronic stress can affect both sleep quality and glycemic control. Therefore, it is necessary to help the individual manage stress.

- Stress management techniques such as meditation.
- Deep breathing.
- Yoga.

These practices can improve sleep quality and reduce cortisol levels, contributing to better diabetes management and quality of life⁶. **D**

CONCLUSIONS

Sleep quality and chronotype are important factors that influence the development and management of T2DM. Evidence suggests that improving sleep quality and considering individual chronotype preferences in management strategies can have a positive impact on glycemic control and the overall health of patients with diabetes. Healthcare professionals should incorporate sleep and chronotype assessments into routine care for individuals with diabetes to optimize treatment outcomes.

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