Dancing dreams: The intersection of ballet and sleep

Edgar Degas’ 1879 portrait of “Deux Danseuses” portrays a scene all too common in dance rehearsal spaces: two dancers hunched over, clad in tutus and pointe shoes, fatigued and aiding their sore feet (Fig. 1).1 In many professional and preprofessional settings, this exhaustion is a daily experience for dancers. Considering the countless hours of physical activity and mental exertion performed by these dancers, it is not surprising that dancers experience exhaustion is a daily experience for dancers. Considering the intense training hours and shift work-like schedules, contributing to feet (over, clad in tutus and pointe shoes, fatigued and aiding their sore

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isn’t surprising that dancers experience insomnia and fatigue.2 Like other elite athletes, dancers are subject to intense training hours and shift work-like schedules, contributing to their sleep deprivation.2 There is interest in athletes’ sleep because sleep deprivation may impact performance, and injuries may impact sleep. As of the beginning of 2024, there are 277 reports cited in PubMed about sleep in football players, 58 articles about sleep in basketball players and 26 articles about sleep in ballet dancers.

However, similar to other art forms, sleep is a recurring theme in dance. Numerous story ballets, or ballets with some sort of plot, depict sleep and dreams. Sleep informs the art, but in performing the art itself, dance also affects the sleep of the artist – the dancer.

From ballet’s origins as a European aristocratic art form to today’s more accessible, modern works, ballets have depicted myths, fairy-tales, folklore, and the most authentic human experiences. Choreographers have portrayed sleep and dreams in numerous ballets – all presenting sleep differently. Yet, these ballets all convey a very familiar story of sleep or dreams. In some, sleep is represented as a state of vulnerability and purity; in others, sleep is mysterious and frightening. Depicting such a universal experience as sleep, choreographers appeal to the audiences’ own experiences, making these often distant and obscure story ballets relatable and more accessible to audiences.

The Nutcracker, composed by Tchaikovsky and choreographed originally by Petipa (reworked by many others such as George Balanchine), is perhaps the most accessible and widely-viewed ballet internationally. Every holiday season, ballet companies across the globe perform this magical ballet of dancing candy canes and wooden dolls. The young Clara is excited about her new gift, a wooden nutcracker doll from Uncle Drosselmeyer, and cannot sleep.3,4 She sneaks down to the living room to play but quickly falls asleep with her nutcracker in hand. In many versions of the ballet, it is unclear exactly when Clara falls asleep. She is alone on a dark stage, and elements of her dreams, including a human-sized nutcracker, begin joining her in the scene. While it is unlikely that Clara fell directly into the dream state of rapid eye movement (REM) sleep, since that is often not achieved until later in sleep,5 Clara’s dreams remind the audience of their own magical holiday dreams. Dreaming is thought to be a process involved in memory formation, with the hippocampus replaying the experiences from the day, such as the joy of receiving the nutcracker.6 Normally, people experience retrograde amnesia as they fall asleep, so it is difficult for them to remember precisely when they fall asleep. This is reflected in the ballet – the transition to sleep is not a sudden, clear moment but gradual as Clara begins dreaming.

In Clara’s dream, the nutcracker comes to life and protects her in a battle against mice, but the nutcracker collapses after the battle, requiring Drosselmeyer to repair the toy.3,4 This scene is intense, with dark stage lighting and choreographed combat. Negative emotions, including fear, tend to predominate in our dreams, and the intense battle between the nutcracker soldiers and mice may reflect this phenomenon.6 Drosselmeyer fixes the toy into a handsome prince who whiskes Clara away into the Land of the Sweets. Clara awakens with the nutcracker still in her hands. The Nutcracker’s depiction of dreams reminds its audience of their own unfortunate nightmares and holiday fantasies.

Another famous depiction of sleep in ballet is in Petipa’s The Sleeping Beauty, inspired by the timeless fairytale. Carabosse, an evil fairy, casts a spell on baby Aurora at her christening, sentencing her to death at the age of 16 by the prick of her finger.8,9 This spell is altered by the Lilac Fairy, the fairy godmother of the baby princess, so that the finger prick results in a 100-year slumber, ended by the kiss of a handsome prince.8,9 When Aurora pricks her finger in the ballet, she begins to fall faint, shown with slow, seemingly heavy movements.8 As she shows her prickled finger to those around her, she begins a very energetic dance, jumping and leaping across the stage.8 This frenzy of movement suggests fear of the impending slumber. At the dance’s climax, Aurora suddenly collapses, as she falls asleep.9 Unlike the familiarity of Clara’s dreams in The Nutcracker that induce feelings of holiday spirit, the depictions of sleep in The Sleeping Beauty rely instead on the audience’s familiarity and appreciation of the classic fairytale and not on the relation with the experiences of Aurora. Aurora’s slumber is more similar to a coma or an extremely exaggerated case of the rare Kleine-Levin Syndrome. Contrary to Aurora’s period of constant slumber for a very extended period, Kleine-Levin Syndrome is characterized by long bouts of sleep, overeating, and other cognitive disturbances, with intervening periods of normal behavior.10 As she rests, the princess seems pure and angelic during her slumber,9 a common depiction of sleep in ballet.

George Balanchine’s dance adaptation of Shakespeare’s A Midsummer Night’s Dream similarly depicts Titania, queen of the fairies, sleeping in a celestial manner.11,12 Titania’s bed, of a mystical shape itself, is brightly illuminated and elevated on the stage. As she
falls asleep, a lullaby-like opera is playing, and the other fairies dance very gently and gracefully, like a whisper to the eyes. Despite ongoing chaos surrounding her during her sleep, Titania is depicted as completely naïve to her surroundings and appears to be in a deep slumber. Naturally, as she moves into REM sleep stages throughout the night, she experiences cataplexy, preventing engagement with slumber. Naturally, as she moves into REM sleep stages throughout the night, she experiences cataplexy, preventing engagement with surroundings and movement during dreams. Until she wakes up, Titania is motionless, being extremely still in her angelic sleep on stage. All is calm until a spell is cast on her, and she mistakenly falls in love with a donkey.

In contrast, Le Corsaire, a 19th-century ballet originally choreographed by Petipa, portrays a Turkish nobleman, the pasha, dreaming of all his beautiful wives dancing. Though this scene has been documented as a “dream scene,” the choreography does not highlight the pasha’s slumber. Instead, the pasha is seen in the downstage corner, appearing to view his dreams himself, reflecting the first-person nature of dreams. The focus of the choreography in this particular balletpic sleep-related scene is on the content of the dream and the impressive dances that each of the wives does. Choreographically, the dreams seem to reflect the pasha’s life experiences and mental states, as dreams often do.

Similarly, dreams seem to become a reality in La Sylphide. This ballet begins with James falling asleep in front of the fire before his wedding day. James dreams about a sylphide, a mystical fairy-like creature who enchants him in his dream. In his dream, this sylphide appears next to him in front of the fire. The dream mimics reality, blending the supernatural or imaginary with James’ home environment. He wakes up, remembers the sylphide, and continuously recalls the beautiful creature throughout the day, imagining her appearing in various locations in the house. While it is unlikely that the dreams occurred if James happened to doze off for a nap unless drastically sleep deprived, dream recall and episodic memory seem to be both associated with activity in the hippocampus. This common pathway between actual memory and recalling dreams likely plays a role in James’ repetitive recall of the sylphide throughout the day. James dreamt and formed the image of the sylphide, and he had an elaborate memory of this dream later.

The sleep scenes of some other ballets do not highlight such vivid dreams as James’. Instead, sleep is depicted as some sort of curse in some ballets, such as in Firebird, where the firebird engages the public in an energetic dance of jumping and twirling, causing them all to collapse from exhaustion. This scene contributes to the mystery and somewhat eerie ambiance that leads up to another character’s death. By causing all the other dancers to collapse from exhaustion, the choreography indirectly shows the firebird’s ability to manipulate others and entice them to do something, furthering this ballet’s storyline. After collapsing in exhaustion and falling asleep, the remaining characters are completely still but begin slow, gentle, nearly ghostly movements.

Perhaps the most interesting depiction of sleep in ballet is the sleepwalker in George Balanchine’s La Sonnambula. This haunting story involves the lust between a flirtatious coquette and a poet at a masked ball before a mysterious — yet enchanting — sleepwalker interrupts. The sleepwalker mesmerizes the poet, and they fall in love. But the question remains whether the sleepwalker is conscious of her interactions with the poet and emotional states, or even of her surroundings. Allegra Kent, who worked with George Balanchine to revive this role, describes the sleepwalker as alert to her surroundings, given the apparent magnetic pull and tension in the choreography.

During one sequence, the sleepwalker scurries across the stage, but the poet creates obstacles in her path. The sleepwalker stops at each of them, seemingly aware, and gently steps over. Kent claims the sleepwalker has an “uncanny perception.” However, in watching the choreography, the audience is struck by the aimlessness of the dancer traveling across the stage, seemingly unphased by her surroundings. Kent also mentioned that the sleepwalker’s movement should make the audience think that she could fall off the stage at particular moments. Sleepwalking, or somnambulism, involves arousals during slow-wave sleep; there is a coexistence of activation of sleep and wake patterns in the brain. During this time, the sleepwalker is likely not alert and will have altered consciousness of her surroundings. Thus, the sleepwalker is likely unaware of what is occurring in this ballet and certainly will not remember it. Yet, there is sort of an ethereal quality to the sleepwalker, clad in a white gown, seeming to float across the stage. The choreography juxtaposes this angelic quality with an abruptness to her movement and changing of directions. La Sonnambula, though nearly a century old now, is still relevant and conveys the mysterious experience of sleepwalking. Depicting sleepwalking engages the audience due to the curiosity that enters so many regarding this cross-over state between sleep and wakefulness.

La Sonnambula appeals to the audience’s curiosity about sleepwalking. As mentioned, other ballets may depict sleep as peaceful or eerie, and those representing dreams often appeal to the audiences’ shared experiences. While some of these depictions are not scientifically accurate, sleep depiction in dance simultaneously brings a perplexing sense of wonder and a familiar scene that audiences can relate to from their own sleep and dreams. Such juxtapositions make dance unique — this art form combines complicated plot-depicting movement with authentic human expressions.
Dance is a unique art form in that its performance is physically demanding, rendering dancers as elite athletes. As such, sleep is not only a theme found in the stories onstage, but a practical reality in the process of maintaining peak physical performance for the dancers themselves, as it is for any athlete.

Dancers have demanding schedules and spend an incredible amount of time engaging in physical activity. Professional ballet dancers often spend at least 7 hours a day in the studio for various classes and rehearsals, not necessarily including their evening performances, and they forgo weekend breaks for additional performances. Companies will have upwards of 100 performance dates per year, performing numerous ballets annually and sometimes performing daily for weeks on end, even including multiple shows in a single day. Professional dancers – having daytime rehearsals and classes and performing during the later hours – have been equated with shift workers in terms of their irregularity of daily routine and sleep schedule. Given these athletic and time demands of professional dance, research on dancers’ sleep habits is of utmost importance to maintaining their health and performance, preserving their longevity, and avoiding fatigue.

Similar to elite athletes, the more time dancers spend training, the less time they spend sleeping, and this is associated with lesser sleep quality. While both dancers and elite athletes reported higher stress and fatigue levels during performance periods, self-reports showed that dancers had lower sleep quality than athletes. Dancers reported their sleep habits via the Athlete Sleep Behavior Questionnaire and dance exposure hours and injuries over 7 months. While sleep was not correlated with injuries in this sample, it was shown that during performance periods, more dance exposure hours (time spent dancing) was associated with fewer hours of sleep. Dancers wearing actigraphs and completing daily sleep diaries also showed that their sleep differed from other age and sex-matched populations. On average, dancers had lower sleep duration and efficiency, with sleep duration decreasing in the week before a ballet premiere. Dancers slept for an average of about 7 hours preceding premiere weeks, but this decreased by 30 minutes during premiere weeks. During this time, there was also an increased incidence of awakenings once in bed. Comparing their baseline with other populations, it was reported that dancers’ sleep efficiency mirrored shift workers’ or those with mild insomnia. One may hypothesize that stress, alertness from dancing in the evening hours before bed, or disruptions in the dancers’ circadian rhythms may explain this insomnia.

Stress levels may interfere with dancers’ ability to fall asleep and have quality sleep. Dancers report stress regarding physical soreness and joint pain, fear of a career-ending injury, performance anxiety, and recalling or executing new choreography. This likely increases in the time approaching a premiere, contributing to the negative trends of sleep duration and quality preceding the performance. Stress increases the activation of the sympathetic nervous system and hypothalamic-pituitary-adrenal axis, including the production of cortisol, all of which promote wakefulness and result in insomnia. Additionally, given the esthetic nature of dance and the social evaluation anxiety coming from audits and performances, dancers tend to exhibit higher trait anxiety, like the socio-evaluative threat experienced by competitive athletes. Such high trait anxiety has been associated with a longer sleep latency and fewer REM periods during sleep. REM sleep may play a role in decreasing the brain’s response to emotional stimuli, further linking REM sleep loss with chronic stress and trait anxiety. Progressive muscle relaxation, which activates the peripheral nervous system to reduce the stress response and leads to relaxation and lower cortisol levels, was successful in some populations of dancers to increase sleep quality. Evidently, the stress and anxiety that professional dancers experience is likely to contribute to insomnia and REM sleep deprivation.

Via circadian regulation of body temperature, physical activity also inhibits sleepiness. Body temperature is an important factor controlled by the circadian rhythm, as the body cools before sleep initiation. With late bouts of physical activity, such as with evening performances, body temperature increases, promoting wakefulness. This extended wakefulness brought on by these performances may cause additional sleep latency and phase delay in the circadian rhythm. Like other athletes, dancers experience a mental excitement, a “high,” after performances that also prolongs sleep onset. Additionally, there is an association between sleepiness and decreased physical performance, suggesting that times of sleepiness are not optimal for performance. Many ballet performances begin later in the evening, around 8:00 PM, and last about 2 hours. When comparing the sleep schedules and chronotypes of dancers training during the daytime vs. the nighttime, those training at night scheduled their sleep time later, despite no differences in circadian preferences. Given this information, to diminish sleep deprivation in dancers and take advantage of prime performance times, dance companies should consider changing schedules so that rehearsals and classes don’t take place early in the day, negatively affecting circadian rhythms and exacerbating sleep deprivation.

Due to inadequate recovery time, dancers cite fatigue and overuse as their main sources of injury. As mentioned, dancers spend a massive amount of time daily engaging in physical activity, and it has been shown that this varies by rank in companies, with soloists bearing the greatest metabolic strain and highest workload on rehearsal days. Most dancers, especially female dancers, don’t take full advantage of their break times, and only 16% across all levels within the company achieve the recommended 8 hours of sleep per day or more. Even at the preprofessional level, 58% of those sampled between 12 and 17 years old slept less than 8 hours. Yet, sleep is vital to physical performance and regulating the metabolism for optimal athletic ability and cognitive functioning. Thus, dancers should be educated on sleep and its effects. Educators and dance companies should encourage dancers to manage their sleep to maximize alignment between their work schedule, Process C (circadian processes), and Process S (sleep drive). Part of this may require companies to adapt their schedules so that dancers avoid circadian disruptions via shift work-like schedules. Dancers should be equipped with strategies to manage insomnia and stress to take full advantage of the restorative effects of sleep and avoid injury and cognitive impairments.

Sleep is vital to professional dancers, as it is to many elite athletes, and the challenges that the profession places on an individual’s sleep are unique and significant. As such, more research is needed to further understand how to optimize sleep for these artists’ performance and well-being. This can better inform how dance companies are structured to avoid dancers’ fatigue – physically and cognitively.

The relationship between sleep and dance is multimodal, as sleep informs the art form in its many appearances in ballets but is also relevant to the artists themselves. Sleep has been depicted in various manners in dance, appealing to the audience’s experiences with sleep and dreams and their curiosity about the unconscious. Often, ballets convey dreams as a way to make the mystical storylines converge with the authentic human experience, and sleep is a universal experience to which all audiences can relate in some way. As a universal experience, sleep also affects the dancers in their cognitive and physical performances in rehearsals and onstage. The unusual work schedules and environments place extraordinary pressures on dancers in terms of stress and incongruencies with their biological clocks, creating unique challenges to their sleep regimes. As both artists and athletes, dancers use sleep as a theme in their work, but sleep also affects their performance and well-being.
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The authors report no conflicts of interest.

References

7. Won C. Insomnia: “I can’t sleep” [unpublished lecture notes], CGSC 175: The Mystery of Sleep, Yale University; lecture given 2023 November 7.

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