Bidirectional relationships between sleep and work

For most people, work is inextricably linked with home life and the amount, timing, and quality of sleep. While the recent novel coronavirus pandemic changed work practices for billions of people, this global change had already started with more and more people working at home, sometimes morning, evening, and night, under increasingly uncertain employment conditions. In addition, our work, home life, and sleep can compete for time, particularly in the face of second and third jobs, flexible schedules, night shift work, unstable work practices, and the emergence of the gig economy. The inevitable compromises, when not well-managed, can result in suboptimal sleep, suboptimal work, and suboptimal home life. Even if time for work, sleep, and leisure can be effectively separated, they still all affect each other. For instance, stress at work can affect subsequent sleep, and the quality and amount of sleep, in turn, can affect subsequent work performance. In this special issue of Sleep Health, there are 20 original research articles from 7 countries that describe the enormity of the issues related to sleep health across work settings, populations, and specific conditions; their impact on workplace productivity and worker health; and interventions to help workers, managers, and workplaces address their priorities and manage these competing demands. By recognizing and publicizing the importance of these interactions, we hope to stimulate researchers to develop and evaluate solutions to the global concern of poor sleep degrading work and quality of life and work degrading health, including sleep health.

Varied facets of sleep health are associated with work characteristics, although specific challenges differ among workers from different industries, contexts, and countries, as addressed in the papers in this special issue on sleep & work, work & sleep. For example, Salas-Nicás et al. conducted a survey of Spanish salaried workers and identified associations between job insecurity (salary decrease or recent restructuring at work) and sleep problems. Furthermore, recent or current household economic hardship was a primary factor associated with sleep problems. This is an ominous finding, given the ongoing severe impact of the COVID-19 pandemic on job stability for a much larger proportion of workers. Shimura et al. examined a wide range of lifestyle and sleep hygiene-related factors associated with sleep disturbances in a large sample of employees from 29 companies in Japan. Long commute times, regular naptimes, irregular meal times, inadequate morning light, and excessive evening light from devices were among the potentially modifiable factors strongly related to sleep disturbances. In a study of oil rig workers using actigraphy, Dr. Zahabi and colleagues identified multiple elements of sleep deficiency and sleep disorders. Using data from the longitudinal Health and Retirement Study, Dr. Cho et al. identified bidirectional, longitudinal relationships between perceptions of effort-reward imbalance, a work-related psychosocial stressor, and sleep problems over a 4-year follow-up period. Persistent effort-reward imbalance predicted greater odds of future sleep problems, whereas sleep problems at baseline predicted greater odds of future effort-reward imbalance. In a large cross-sectional study of Hispanic/Latino adults Tom et al. found, in adjusted models, that short sleep duration was associated with more work-related physical activity per day, but not transportation or leisure-related physical activity, suggesting that greater work demands can negatively influence sleep duration. Elliman and colleagues report on occupational hazards for US Army drill sergeants, including long working, short sleep, and consequences of excessive sleepiness such as falling asleep behind the wheel. Visvalingam et al. evaluated the self-reported sleep of a multiethnic sample of full-time employees in Singapore. The prevalence of poor sleep quality was over 40%, and two-thirds obtained less than the recommended amount of sleep. As other authors did, they recommend workplace policies and intervention programs to improve worker sleep health.

Ishibashi and Shimura examined the impact of sleep health on productivity in a sample of working adults in Japan. In fully adjusted models, poor sleep quality, sleep disturbances, and use of sleep medications were each associated with greater presenteeism, a measure of reduced productivity while at work. Taylor et al. evaluated, in a sample of over 200,000 US Air force recruits, the impact of “difficulty sleeping at night” on the likelihood of being discharged for any reason within 1 year. In trainees discharged within 1 year, difficulty with sleep was a strong predictor of attrition. Shriane et al. queried Australian paramedics and found that these shift workers as a group had little knowledge of sleep hygiene recommendations, highlighting an opportunity for interventions. Grier et al. evaluated special operations soldiers in the US Army, finding that short sleep duration more than doubled the risk of a musculoskeletal injury within a year. Stimpfel et al. studied a cohort of registered nurses in the United States, finding that the prevalence of short sleep was high; a majority of these nurses were sleeping less than the recommended amount (7 or more hours per night) on a regular basis. They also identified cross-sectional associations of shorter sleep duration with lower reported quality of patient care and reduced patient safety. Current conditions in the US healthcare system with the COVID-19 pandemic are likely to make this situation even worse. Future surveillance of the health and well-being of healthcare workers, a particularly vulnerable group in a pandemic, should include sleep health as a modifiable factor that may impact workforce health and potentially patient care quality.

Driving is an activity where sleep and work can clash with especially drastic consequences, including crashes and loss of life. There are three articles about driving in this special issue. Crain et al. developed...
a conceptual model of driver sleep and fatigue in the ride-sharing gig economy and provide practical suggestions on how researchers, companies, and drivers can improve sleep health, reduce fatigue, and improve performance and safety in the ride-sharing industry. Wolkow et al10 examined how a simple, noninvasive, wrist-worn heart rate monitor could be used to detect drowsiness in heavy vehicle drivers in Malaysia. Even though the device could not always reliably detect the occurrence of a drowsy driving event, simply wearing the device appeared to have altered the drivers’ behaviors and resulted in a decrease in the rate of harsh braking events in naturalistic conditions. Sleep scientists often talk about the “drive to sleep” that increases as a consequence of staying awake for long periods, a process modulated by the internal circadian system, which leads to especially decreased vigilance. Long-haul drivers often drive through this vulnerable period of increased sleepiness when the circadian body temperature is lowest, usually in the early morning. Dziez et al10 reported that long-haul bus drivers in Argentina combine sleep at different locations (bus, destination, and home) to obtain on average 6–7 hours of sleep, but those exposed to higher risk working schedules (e.g., overnight shifts) had disrupted circadian temperature rhythms. Such studies are important for helping to design optimal fatigue management systems for drivers. In a systematic review and meta-analysis, Dr. Patterson et al11 evaluated the role of exposure to shift work on sleep-related blood pressure dipping. The limited heterogeneous research was judged to be of low quality and mostly acute studies, but suggests that the dip in blood pressure during sleep was not blunted in shift work.

In addition to the long-haul driver study that examined circadian rhythmicity, two other papers study shift work in relation to circadian rhythms and sleep. Shift work disorder (SWD), a medical diagnosis that involves excessive sleepiness or insomnia caused by the work schedule, is common. Given the strength of the circadian system and the amount of sleep disruption caused by shift work, it is perhaps surprising that more night shift workers do not complain of SWD symptoms. Dr. Bastille-Denis et al12 found that, when compared to shift workers who slept well, shift workers with SWD had more thoughts that kept them awake, including presleep cognitive arousal and worries. This suggests that cognitive variables may provide an avenue for SWD therapies. Relatedly, Khan et al13 found that paramedics, who often perform shift work, had higher symptoms of depression, anxiety, fatigue, posttraumatic stress disorder (PTSD), and insomnia and lower well-being than the general population in Australia. These symptoms were particularly apparent in those shift workers who were “night owls” (evening chronotypes), compared to those who were morning chronotypes. Thus, addressing sleep issues and, perhaps, matching chronotype to shift preference, could help to improve mental health and well-being in shift workers.

In an intriguing article on sleep and leadership, Barnes et al14 describe a series of studies evaluating the relationship of workplace leadership behaviors with subordinates’ sleep and ethical behaviors. Leaders exhibiting behaviors that “devalue” sleep have employees with poorer sleep quality, “above and beyond the effects of abusive supervision and other alternative explanations.” Further, in mediation analyses, poorer sleep quality mediated the effect of leaders’ devaluing of sleep on their subordinates’ self-reported unethical behavior. Workplaces represent a target-rich area for interventions to improve employee sleep (e.g., Olsen et al15). Sophrov and colleagues23 conducted a systematic review of workplace health promotion programs to improve sleep among men and identify intervention program design features associated with improved sleep.

Unpacking the many facets of sleep health encompassed by “difficultly sleeping” in workers could be a fruitful area for investigations and intervention efforts. Future studies are needed to assess the impact of the global downturn, pandemic mitigation practices, and related anxiety on sleep health. Interventions will need to consider the effects of economic hardship on sleep health, mental health, and physical health and recognize the existence of major disparities in the extent and impact of these hardships.

We hope you enjoy this special issue of Sleep Health on sleep & work, work & sleep.

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Reference


