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Sleep Disorders, Public Health, and Public Safety

Michael A. Grandner, PhD and Allan I. Pack, MBChB, PhD

Center for Sleep and Circadian Neurobiology, Division of Sleep Medicine, Perelman School of Medicine, University of Pennsylvania, Philadelphia.

Inadequate sleep and sleep disorders have been associated with all-cause mortality,^{1,2} as well as with several leading causes of death, including motor vehicle crashes and cardiovascular disease. Inadequate sleep or sleep disorders have consequences in 2 major domains: excessive sleepiness with behavioral consequences, leading to risks including increased rate of motor vehicle crashes³; and cardiometabolic consequences, leading to an increased risk of obesity and insulin resistance.⁴

Attention has been focused on the public health implications of sleep deprivation and sleep disorders. The Institute of Medicine published 2 separate reports in the past few years that address this issue.^{2,5} Obtaining sufficient sleep has been designated as a national health priority within Healthy People 2020.⁶ Increasing awareness of the public health implications of insufficient sleep has also drawn attention to the public safety implications. This has resulted in considering appropriate policies regarding medical resident duty hours, work schedules for physicians and airline pilots, and screening for sleep disorders in commercial vehicle drivers and other workers in occupations that have round-the-clock operations that require continuous vigilance.

The study by Rajaratnam and colleagues⁷ in this issue of *JAMA* represents an important contribution regarding the public health and public safety implications of sleep deprivation and untreated sleep disorders. The authors conducted a large, complex study that involved in-depth assessment of a municipal police agency and a state police agency and a national survey study of police officers regarding sleep, sleep disorders, health, and functional outcomes.

Among the main findings was the high prevalence of poor sleep and unrecognized sleep disorders among police officers. Potentially adverse effects on the public at large as well as on the affected individuals were detailed, reported as odds ratios (ORs) adjusted for demographics, occupational factors, body mass index, and other risk factors. Not only were sleep disorders (especially sleep apnea) common among police officers, but in cross-sectional analyses, the presence of a sleep disorder was associated with depression (OR, 2.20; 95% CI, 1.52-3.19), occupational burnout (OR, 2.85; 95% CI, 2.16-3.77), and other adverse outcomes. Sleep apnea, in particular, was associated with increased likelihood of cardiovascular disease (OR, 1.95; 95% CI, 1.20-3.18). In addition to the implications for their health, in longitudinal analyses, those police officers with sleep disorders were at somewhat increased risk for a number of work-related adverse outcomes. They had higher rates of administrative errors (OR, 1.43; 95% CI, 1.23-1.67), safety violations (OR, 1.63;

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Corresponding Author: Michael A. Grandner, PhD, University of Pennsylvania Center for Sleep and Circadian Neurobiology, 3624 Market St, Ste 205, Philadelphia, PA 19104 (grandner@upenn.edu).

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95% CI, 1.43-1.85), falling asleep at the wheel (OR, 1.51; 95% CI, 1.20-1.90), uncontrolled anger toward citizens or suspects (OR, 1.25; 95% CI, 1.09-1.43), citizen complaints (OR, 1.35; 95% CI, 1.13-1.61), absenteeism (OR, 1.23; 95% CI, 1.08-1.40), and other outcomes. Not only are police officers at high risk of having an undiagnosed sleep disorder, but the sleep disorder may have a detrimental effect on the officer's health, productivity, and job performance.

There are many pathways by which poor sleep might impair health and increase mortality risk. Recent Centers for Disease Control and Prevention⁸ data show that after adjusting for age, sex, race, socioeconomic status, and overall health, individuals who obtained fewer than 5 hours of sleep on a regular basis (vs 7 hours) were 42% more likely to be obese, 40% more likely to have diabetes, 69% more likely to have hypertension, 36% more likely to have high cholesterol, 62% more likely to have had a stroke, and 152% more likely to have experienced a heart attack. Obstructive sleep apnea, the most common sleep disorder among the police officers studied, has been implicated as an independent risk factor for cardiovascular disease⁹ and insulin resistance.⁹ Sleep apnea also results in significant impairments in cognitive function and the ability to maintain wakefulness, especially during tasks that require vigilant attention. These effects can be reversed by therapy.⁹ This functional impairment makes untreated sleep problems also an issue of public safety.

The public has a justified interest in addressing the risks associated with sleep problems. Relatives of victims of motor vehicle crashes resulting from the driver falling asleep at the wheel have started taking action, such as advocating for drowsy driver legislation in New Jersey and establishing the nonprofit organization Parents Against Tired Truckers.¹⁰ In the occupational arena, some employers are developing proactive educational programs, and a few are initiating programs for mandatory screening for common sleep disorders such as sleep apnea.¹¹ The latter is likely to be the most effective approach, but employees may have concerns that if they are found to have a sleep disorder, their employment will be adversely affected. In some occupational areas, there appears to be some reluctance to introduce such programs. For example, in 2008 a medical expert panel created by the Federal Motor Carrier Safety Administration (responsible for the safety of commercial vehicles) gave recommendations on screening for sleep apnea,¹² although to date the agency has not implemented any of the recommendations, which included provisions for sleep disorder screening and restrictions placed on those with untreated sleep apnea.

There is a need for additional research studies evaluating sleep problems in the occupational area, including screening employees for sleep disorders and evaluating different interventions in individuals who are diagnosed with sleep disorders. Such studies need to be large enough to allow evaluation of the health effects for the individual as well as the economic implications for the employee and employer and the larger effect on society as a whole. Because police forces are focused on public safety, the study by Rajaratnam et al⁷ may represent an impetus for further studies of police forces that could set an example for other occupational groups.

As a matter of public health, the study by Rajaratnam et al⁷ speaks to the issue of the general underdiagnosis and undertreatment of sleep disorders in the overall population, with important implications for health and functioning. As a matter of public safety, this study illustrates that the public at large may also be at risk when police officers are impaired in performing their duties because of sleep deprivation or an untreated sleep disorder. Now, the question is what police departments will do with this new information.

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