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Review Article

Toward Better Sleep for Workers: Impressions of Some Needs

Roger R. ROSA[1]*

[1] National Institute for Occupational Safety and Health, Office of the Director, Room 715H, Hubert H. Humphrey Building, 200 Independence Ave SW, Washington, DC 20201, USA

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Abstract: We know there are persons exposed demanding work schedules and sleep loss in almost every occupation or industry, but we still need better population-based information on how many sleepy or inattentive workers there are, where they are, and to what extent they are a risk to themselves or others. The absence of such information, however, does not prevent us from continuing to conduct worksite interventions and demonstrations that will produce good, evidence-based guidelines to help workers and workplace administrators make informed choices about sleep and provide optimal conditions for sleep. In addition, systematic study and publication of how managers and policy-makers accept our research to make worksite changes, and what factors beside our research influence their decisions, would contribute techniques to the greater public health community aiming to translate research results into good practice.

Key words: Sleep loss, Sleepiness, Surveillance, Work schedule design, Intervention, Translation

Introduction

The fact that work and sleep can be uneasy bed partners requires no sophisticated research and would surprise few working people. Nonetheless, data continue to remind us of this fact. Recent results from a national time use survey in the United States indicates that working people sleep less than those who are not employed, and workers holding multiple jobs sleep less than those with a single job[1)]. Sleep also tends to be shorter on workdays compared to free days[2)], and among individuals whose schedules require night work, rotating shifts, early morning awakening, or long working hours[3–5)]. However, the extent to which inadequate sleep or excessive sleepiness is associated with a particular occupation or industry, or specific working conditions, or how such disruptions and associated risks are distributed across occupations or industries, is still relatively unknown on a population level. In the United States, there are no national surveillance systems that identify sleep loss or sleepiness in relation to work, but there is some information on work schedules that might contribute to sleepiness. The estimate for night, rotating, or irregular shift workers in the United States in 2001 is 8.4% of all full-time working adults, or 8.4 million people[6)]. United States national estimates for early morning awakening or long hours are much less clear but would add to the significant portion of the adult population that at least occasionally loses sleep and may be working with drowsiness that can reduce performance or increase the likelihood of operational errors or compromised safety.

Surveillance Needs

Because there are persons engaged in demanding work in almost every category of occupation or industry, more specific information about the occupations and industries most affected would be welcomed. Even among the more

*To whom correspondence should be addressed.

obvious public safety or health care occupations, who regularly work shifts and may confront long hours or overtime, we still need more discrete *population-based* information on how many sleepy or inattentive workers there are, where they are, and to what extent they are a danger to themselves or others. Across occupations or industries, such information could be used to estimate the cost to society of occupationally-related sleep loss and excessive sleepiness, or the extent to which the sleepiness compromises worker or public safety and health or contributes to lost productivity. The information also could be used to target workers most in need of countermeasures to sleep disruption and excessive sleepiness, and for whom countermeasures can be applied effectively. Toward this end, simple, low-cost, reliable indicators of sleep loss or sleepiness need to be developed to enhance surveillance system capabilities to identify sleepy workers. National occupational surveillance systems, at least in the United States, contain very few indicators that might be associated with sleep or sleepiness and rare references to work scheduling as a potential pointer to sleep. The U.S. Bureau of Labor Statistics, Survey of Occupational Illnesses and Injuries[7], for example, only recently began collecting minimal information related to work schedules, i.e., the time of injury and the time the injured individual started work. The population prevalence of other work schedule factors that may contribute to sleep loss, such as extensive daily or weekly hours, direction of shift rotation, long stretches of night work, or irregular starting and ending times, are not well documented in the United States. This situation appears to be similar around the world. For example, a European Union Directive to limit weekly work time and enforce a minimum daily rest time[8] permits exceptions for certain industries (e.g., agriculture) or occupations (e.g., managers). While these exceptions provide clues to the location of demanding work schedules, or potentially sleepy workers, systematic tracking of excepted workers across the European Union is not readily apparent.

Research to Practice

Inadequate surveillance data for large working populations should not prevent us from continuing to research optimal schedules and strategies that afford more sleep and encourage workers to take advantage of opportunities to sleep. As we devise those strategies, we are confronted with the fact that sleep is almost exclusively under individual control. Thus, clever administration, planning, or scheduling only create conditions conducive to sleep but can not force an individual to sleep. This difficulty was highlighted recently in a national survey of medical residents in training in the United States[9] who often are required to be on duty in hospital for periods of 24–36 h or more. Despite those demanding schedules and repeated bouts of sleep deprivation, the residents often did not fill their free time with sleep as other personal pursuits, or second jobs, took precedence.

Regardless of the inclinations of the individual, it is incumbent upon occupational safety and health researchers to produce good, evidence-based guidelines, based on worksite demonstrations and interventions, so that both workers and workplace administrators can make informed choices about sleep and provide the optimal conditions to do so. Along those lines, we can be encouraged by more frequent reports in recent years of worksite evaluations or interventions, such as attempts to redesign work schedules to be more conducive to sleep and improve other aspects of worker well-being. Both successes and failures, and positive, negative, and null results of those demonstrations need to be reported along with acknowledgment of the limitations of the study approaches. Twelve-hour shift schedules, for example, are not necessarily more fatiguing than 8-hour shift schedules[10], night float systems may or may not improve the sleep of medical residents[11], working a half-day before night shift may help single nurses but not married ones[12], and napping can improve waking function given proper timing[13] but not too much prior sleep loss[14].

Despite some equivocal results, the upswing in worksite evaluation activity over the past 10–15 yr goes a long way toward building a consensus of best practices and validation of some elegant frameworks for design and implementation of good work-rest schedules[15]. Thus, work-related sleep researchers can take heart in contributing to a rapidly growing trend[16] toward more "results-oriented" investments of health research funds, whether it be couched in terms of translation research, research-to-practice, prevention/intervention effectiveness, or health promotion. Within that trend, work-sleep researchers and practitioners could benefit from researchers in other health fields who are examining the translation process itself. We share their goal of moving good ideas to the workplace in a timely manner and, hopefully, an optimism that we can accomplish translation more quickly than in the past, given current health funding priorities and advances in information technology. Quickening the pace would benefit from more systematic study *and publication* of how managers and policy-makers accept our research to make worksite changes, and what factors beside our research influence their decisions. Models such as those reported by Elliott and Popay[17] in their study of health care policy decisions could inform this process in

the workplace. Elliott and Popay highlight factors such as research relevance, long-term persuasive interaction between researchers and decision-makers, non-research influences on decisions, and external political and economic pressures that are very familiar to work-sleep field researchers but rarely reported systematically in our literature. More of those kinds of reports might help the next researcher negotiate the path toward implementation of good work scheduling or work-sleep practices. More broadly, such reports would make a valuable contribution to translation research in general and help fuel the fervor for evidence-based policy and practice in any field.

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