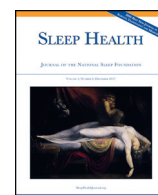




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Better previous night sleep is associated with less next day work-to-family conflict mediated by higher work performance among female nursing home workers

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ABSTRACT

Objectives: Cross-sectional research has found that shorter and poorer sleep are associated with lower work performance and greater work-to-family conflict (WTFC). However, we know little about daily mechanisms linking sleep, work performance, and WTFC. This study tested whether previous nights' sleep was linked to next day WTFC, mediated by work performance.

Design: Daily interview methodology.

Setting: US extended-care workplaces.

Participants: One hundred seventy-one female employees with children aged 9 to 17 years.

Measurements: In telephone interviews on 8 consecutive evenings, participants reported their daily work performance (work productivity, work quality), WTFC (e.g., "how much did things you wanted to do at home not get done because of the demands your job put on you?"), and previous nights' sleep duration (in hours) and sleep quality (1 = very badly, 4 = very well).

Results: Multilevel models revealed a significant association between previous night's sleep with next-day work performance. More specifically, on days following better sleep quality than usual, participants reported better work productivity than usual. Moreover, higher work productivity was associated with less WTFC on that day. A mediation test revealed that poorer previous night's sleep quality predicted less work productivity the next day, which, in turn, predicted more WTFC on the same day.

Conclusion: Results provide evidence for the downward spiral of resource losses starting from poor sleep. Better quality sleep, as a replenished resource, may promote next-day productivity at work, which may bring less interference from work to the home.

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Introduction

Approximately 1 in 3 employed individuals report not getting enough sleep¹ and working more hours per week is associated with reduced hours of sleep per night.² Moreover, approximately half of US employees report that they experience non-refreshing sleep a few nights per week or more.³ Research has also found that work-to-family conflict (WTFC) – which occurs when work demands interfere with personal and family life – has been increasing over the years.^{4,5} Although evidence has emerged from cross-sectional research that individuals who report poorer sleep are more likely to report higher levels of WTFC,^{6–8} less research has focused on understanding the short-term processes linking sleep and WTFC.⁹

Cross-sectional evidence has emerged that poorer sleep has negative implications for work performance,^{3,10} and that poorer work performance is associated with more WTFC.^{11,12} Thus, it is possible that work performance is a mechanism underlying the established link between sleep and WTFC. Yet, thus far, no studies have tested the effects of sleep on WTFC mediated by work performance. According to the Work-Home Resources (W-HR) model,⁹ improved personal resources – which includes physical recovery resources such as sleep – may improve work and home outcomes, ultimately reducing WTFC. In contrast, an initial loss in a personal resource may result in a downward loss spiral of resources across domains. For example, starting the day off following nights with poorer recovery sleep may result in lower performance at work (i.e., lower levels of work productivity and work quality), ultimately leading to more interference with family/personal activities after work (i.e., more WTFC). Thus, we could expect negative effects of shorter and poorer sleep

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on work performance and further on WTFC, however, limited research has tested short-term processes linking sleep → at work → after work constructs.

The present study extends the research on links between sleep and WTFC by examining *daily short-term processes* linking sleep to WTFC mediated by work performance. To better understand these associations, we draw upon a sample of employees in the extended-care industry (i.e., nursing homes). The extended-care industry is an industry that is experiencing faster than average job growth in the United States due in part to the aging population.¹³ Most employees in this industry are women and also mothers.¹⁴ Working mothers in the extended-care industry may be particularly vulnerable to sleep deficiencies and WTFC as a result of unpredictable care demands from their patients, varying work schedules, and other caregiving responsibilities at home.^{14,15} Thus, focusing on mothers employed in the extended-care industry may provide better insight into whether and how insufficient and poor sleep is associated with experiencing more negative WTFC in a particularly vulnerable, at-risk population.

Thus far, a small but emerging line of research examining temporal associations between nightly sleep and daily experiences suggests that sleep quality and sleep duration are more likely to be predictors of next-day experiences, including WTFC. For example, Lee et al.¹⁶ reported that poorer sleep quality and shorter sleep duration predicted more next-day WTFC in a sample of IT workers. Such pattern was also observed in another study that revealed poorer sleep quality predicted lower emotional well-being and greater odds of encountering stressors the following day.¹⁷ Guided by these studies and also the W-HR model⁹ that suggests good sleep – as a personal recovery resource – may improve work performance and reduce WTFC, we expected that previous night's better sleep would predict better work performance, and further, lower WTFC the next-day. Specifically, the following daily associations were predicted:

Hypothesis 1: Poorer sleep quality and shorter sleep duration (than usual) during the previous night will be associated with lower levels of work productivity and work quality the next day.

Hypothesis 2: Lower levels of work productivity and work quality (than usual) on a given day will be associated with experiencing more conflicts from work-to-family on that day.

Hypothesis 3: Poorer sleep quality and shorter sleep duration (than usual) the previous night will be indirectly associated with higher levels of work-to-family conflict the next day, mediated by lower levels of work productivity and work quality.

Method

Participants

Data were part of a larger study examining the impact of work conditions on organizational outcomes and the health of employees and their families.^{18,19} For the current study, participants included US employees in the extended care industry (i.e., nursing homes; 30 work sites located in the northeastern United States) who participated in an 8-day telephone interview sub-study. Eligible employees for the larger study were involved in direct patient care, typically worked at least 22 hours/week, and did not do regular night work. Eligible participants for the daily telephone interview sub-study included individuals who had a child between 9 and 17 years of age living at home (to recruit the target child in a child daily telephone interview as well). A total of 182 employees completed the daily interview portion of the study. The extended-care industry is comprised mostly of female workers, and only 8 male workers completed daily interviews; they were dropped from the analyses. In addition, 3 more individuals were removed because they did not report working

at least 1 day during data collection, resulting in a final sample size of 171 employed women.

A majority of participants were married/cohabitating (64%) and reported having at least a high school degree: 6% reported some high school, 30% reported graduating high school, 54% reported some college or technical school, and 10% reported graduating from college. On average, participants were 38.54 ($SD = 6.40$) years old, worked at the company for 6.38 ($SD = 5.75$) years, worked 36.70 ($SD = 8.09$) hours per week, and reported 2.24 ($SD = 1.11$) children living at home. Sixty-two percent were White, 15% were Hispanic, 13% were Black, and the rest 10% included Asian Indian, "Other" Asian, "Other" Pacific Islander, "some other race," or multiracial. More than half of participants worked a standard daytime schedule (59%), 21% worked regular evening shift schedule, 13% reported a schedule that changes from day to day or rotating shifts, and 7% reported split shifts or long/double shifts.

Procedures

The larger study included a workplace interview for employees, conducted by trained interviewers using computer-assisted personal interviews (CAPI). Participants were recruited through study posters and informational material posted throughout the workplace, letters and brochures that were sent as an insert with their paycheck, and research personnel participated in workplace meetings and organized several "meet and greet" sessions to provide information about the study to employees.

At the end of the workplace interview, employees with a child aged 9–17 were recruited (via computer-assisted scripts and a brochure) to participate in the daily interview portion of the study. Daily assessment methods, which require participants to report on their experiences, moods, stressors, etc. for multiple consecutive days, may be particularly useful methodologies to better understand short-term processes linking sleep and WTFC.²⁰ This method allows for the examination of the commonly studied between-person associations (e.g., On average, do individuals who report better sleep quality than others in the sample report lower WTFC on average across days?) in addition to within-person associations (e.g., When participants report better sleep quality *than usual* the previous night, do they also report less *than usual* WTFC the next day?).

Data collection began with informed consent/assent procedures, which were approved by the Institutional Review Boards of the project's principal investigators. A series of eight, consecutive nightly phone calls with the employee-parents were scheduled and conducted by trained personnel at the University's survey research center. This center specializes in collecting daily telephone interview data, and all interviewers receive training by research personnel. A total of 373 female employees were eligible for the daily interview portion of the study (i.e., had a child age 9–17), and 182 employees (174 female employees) chose to participate. To determine if those who chose to participate differed from those who chose not to participate in the daily interview portion of the study (i.e., eligible mothers with a child age 9–17 who completed the larger part of the study, but chose not to participate in the daily interviews), t-tests and chi-square analyses were conducted to compare the groups on basic demographic information. Results revealed that those who chose to participate did not significantly differ from those who chose not to participate in terms of education, age, income, number of children in the home, tenure at work, race/ethnicity, and marital status.

Nightly interviews were conducted at the times most convenient for participants to increase compliance and accommodate participants' busy schedules. After participants were asked to move to a quiet and private location, employees reported on their daily experiences including stressors, interactions with family members, physical health (including previous night sleep), affect, and time use. On

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