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Associations among patient care workers' schedule control, sleep, job satisfaction and turnover intentions

Rebecca M. Brossoit[1], **Tori L. Crain**[1], **Leslie B. Hammer**[2,3], **Soomi Lee**[4], **Todd E. Bodner**[3], **Orfeu M. Buxton**[5,6,7]

[1]Department of Psychology, Colorado State University, Fort Collins, Colorado

[2]Oregon Institute for Occupational Health Sciences, Oregon Health & Science University, Portland, Oregon

[3]Department of Psychology, Portland State University, Portland, Oregon

[4]School of Aging Studies, University of South Florida, Tampa, Florida

[5]Department of Biobehavioral Health, Pennsylvania State University, University Park, Pennsylvania

[6]Department of Medicine and Neurology, Brigham and Women's Hospital, Boston, Massachusetts

[7]Division of Sleep Medicine, Harvard Medical School, Boston, Massachusetts

Abstract

Healthcare is the fastest growing occupational sector in America, yet patient care workers experience low job satisfaction, high turnover, and susceptibility to poor sleep compared to workers in other jobs and industries. Increasing schedule control may be one way to help mitigate these issues. Drawing from conservation of resources theory, we evaluate associations among schedule control (i.e. a contextual resource), employee sleep duration and quality (i.e. personal resources), job satisfaction, and turnover intentions. Patient care workers who reported having more schedule control at baseline reported greater sleep duration and sleep quality 6 months later, as well as higher job satisfaction and lower turnover intentions 12 months later. Workers who experienced greater sleep sufficiency (i.e. feeling well-rested) reported higher job satisfaction 6 months later, and workers who experienced fewer insomnia symptoms (i.e. trouble falling and staying asleep) reported lower turnover intentions 6 months later. The association between schedule control and job satisfaction was partially mediated by greater sleep sufficiency, though this effect was small. Providing patient care workers with greater control over their work schedules and opportunities for improved sleep may improve their job attitudes. Results were not

Correspondence Rebecca M. Brossoit, Department of Psychology, Colorado State University 1876, Campus Delivery. Fort Collins, CO 80523-1876, USA., rebecca.brossoit@colostate.edu.

CONFLICT OF INTEREST

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DATA AVAILABILITY STATEMENT

The authors are unable to share data used in this paper because the data were collected as part of the Work, Family and Health Study (WFHS) and are not public. Restricted data applications are available at workfamilyhealthnetwork.org.

replicated when different analytical approaches were performed, so findings should be interpreted provisionally.

Keywords

job satisfaction; patient care; schedule control; sleep duration; sleep quality; turnover intentions

1 | INTRODUCTION

Patient care workers (e.g. nurses, certified nurse assistants [CNAs]) often experience low job satisfaction and have high turnover rates (e.g. McHugh, Kutney-Lee, Cimiotti, Sloane, & Aiken, 2011; Nursing Solutions, Inc., 2017; Zangaro & Soeken, 2007). This can be harmful to the workers themselves (e.g. experiences of stress), their patients (e.g. quality of care received) and their organizations (e.g. reduced work productivity, turnover and costs of hiring and training new employees). Notably, the turnover rate for nurses and CNAs is the highest it has been in the past decade, and it is estimated that this could cost American hospitals up to seven million dollars annually (Nursing Solutions, Inc., 2017). Healthcare is also the fastest growing occupational sector, with a projected increase of 2.4 million new jobs (i.e. 16% growth) between 2016 and 2026 to meet the demands of the aging population in the United States (Bureau of Labor Statistics, 2018). Although the healthcare industry is comprised of a wide variety of job types, the federal government has specifically recognized the increasing demands for workers in extended care facilities (Congressional Budget Office, 2013). The ongoing rapid growth of the healthcare industry's labour market, particularly in extended care, highlights the need to improve job satisfaction and reduce turnover intentions of patient care workers in extended care facilities.

Although poor sleep is a public health concern at a national level (Centers for Disease Control and Prevention, 2015), disrupted sleep is also a common job-related problem that patient care workers experience (e.g. Owens, 2007). In one study, the majority of nurses surveyed reported experiencing insufficient sleep and only one-quarter reported sleeping for more than seven hours per night (Suzuki, Ohida, Kaneita, Yokoyama, & Uchiyama, 2005). Other work has found that critical care nurses experience chronic fatigue, regardless of the shift they work (i.e. fatigue is comparable for those on the day and night shift; Ruggiero, 2003). An inadequate amount of sleep and low-quality sleep puts workers at risk for physical and mental health problems, as well as work-related deficits, such as decrements to work performance and violations of safety protocols (e.g. Brossoit et al., 2019; Kessler et al., 2011; Uehli et al., 2014; Watson et al., 2015). These risks are particularly critical for patient care workers because their performance and safety at work has implications for the rehabilitation and health of their patients. Indeed, poor sleep of these workers has a negative impact on the quality of patient care they provide (Philibert, 2005; Weinger, 2002).

There is a clear need to identify ways to increase patient care workers' job satisfaction, reduce their turnover intentions and improve the amount and quality of sleep they obtain. One possible way to improve these outcomes is for organizations to provide flexible scheduling options that can increase job control. Past research suggests that general job

control (i.e. autonomy in how employees meet job demands and complete their work; Karasek Jr, 1979) is related to improved sleep and job attitudes (e.g. Linton et al., 2015; Loher, Noe, Moeller, & Fitzgerald, 1985; Van Laethem, Beckers, Kompier, Dijksterhuis, & Geurts, 2013). More specifically, having flexible work schedules is also beneficial for employees' health and effectiveness at work (Tausig & Fenwick, 2001; Hurtado et al., 2015; Kelly & Moen, 2007). Drawing from conservation of resources (COR) theory, the present study seeks to identify whether the resource of schedule control can improve patient care workers' sleep, job satisfaction, and turnover intentions and whether personal resources of sleep duration and quality act as mediators in the associations between schedule control and job attitudes.

2 | CONTRIBUTIONS

Our model is informed by COR theory, a resource-based theory that describes how people are motivated to protect, acquire, and prevent the loss of resources to avoid negative outcomes (Hobfoll, 1989; Hobfoll, Halbesleben, Neveu, & Westman, 2018). Although COR was developed as an occupational stress theory, testing COR with work-related outcomes besides those related to strain has been noted as a useful and welcomed extension of the theory (Hobfoll et al., 2018). In this study, schedule control is viewed as a constructive contextual resource that can facilitate the generation of other resources, such as physical personal resources like sleep duration and quality. In this way, we consider how resources provided by the work environment can influence employee-level resources and subsequent outcomes (i.e. job satisfaction and turnover intentions) that are important for both organizations and employees. We also examine sleep duration and quality as personal resource mediators through which schedule control influences patient care workers' job attitudes. Research has shown that schedule control has a positive influence on employees' sleep and job attitudes (e.g. Lyness, Gornick, Stone, & Grotto, 2012; Moen, Kelly, Tranby, & Huang, 2011), and sleep has been shown to relate to job satisfaction and turnover intentions (e.g. Litwiller, Snyder, Taylor, & Steele, 2017; Scott & Judge, 2006). However, the evaluation of sleep as an explanatory variable between schedule control and these job attitudes has yet to be investigated.

Additionally, scholars have argued that sleep duration and sleep quality are distinct constructs and should therefore be examined in tandem (Barnes, 2012; Crain, Brossoit, & Fisher, 2018; Litwiller et al., 2017). Despite this, most sleep research in the organizational sciences has examined either sleep duration or quality, but not both, with the majority of past research emphasizing sleep quality rather than duration (Litwiller et al., 2017). For these reasons, the present study considers measures of both sleep duration and sleep quality as separate mediating constructs. Sleep duration is a measure of the amount of sleep someone obtains, whereas sleep quality is typically measured with insomnia symptoms and subjective experiences of sleep, such as feeling well-rested upon awakening (e.g. Crain et al., 2018; Harvey, Stinson, Whitaker, Moskovitz, & Virk, 2008; Litwiller et al., 2017; Watson et al., 2015). Assessing only sleep duration or sleep quality limits our understanding of the potentially unique role of each construct (e.g. Buysse, 2014), and knowledge of which sleep construct (i.e. duration and/or quality) relates to schedule control and subsequent job attitudes is necessary for identifying effective intervention targets.

Finally, there is a need to understand the role of schedule control for people working in healthcare, an industry characterized by strict regulations, stressful working conditions, and poor employee outcomes. Employees in patient care positions are particularly important to study because of the compounded stressors that they face (e.g. exposure to human suffering, long work hours, mistreatment and violence from coworkers, patients, and patient families; Jennings, 2008; Hutchinson, Vickers, Jackson, & Wilkes, 2006; Jackson, Clare, & Mannix, 2002), which likely deplete their available resources. Further, patient care workers are especially vulnerable to negative job attitudes and sleep outcomes (e.g. McHugh et al., 2011; Nursing Solutions, Inc., 2017; Suzuki et al., 2005; Zangaro & Soeken, 2007). Additionally, the handful of studies that have begun to assess the influence of schedule control have taken place primarily in professional-level contexts (e.g. headquarters of a Fortune 500 retail company, Kelly, Moen, & Tranby, 2011; information technology company, Crain et al., 2019; Olson et al., 2015). An overrepresentation of professional workers in research impedes gaining an understanding of the experiences of lower-income, hourly workers (Bergman & Jean, 2016; Chen, 2016). If interventions are developed to improve worker health, well-being, and experiences at work, these initiatives will be tailored to the professional populations that have been studied, and may not generalize to other groups of workers. For these reasons, we aim to understand the potential benefits that schedule control can have on patient care workers' subsequent sleep, job satisfaction, and turnover intentions.

3 | THEORETICAL RATIONALE: COR THEORY

COR theory is based on the premise that people strive to protect and acquire resources, which are defined as things that are valued and help people achieve their goals or obtain other resources (Halbesleben, Neveu, Paustian-Underdahl, & Westman, 2014; Hobfoll, 1989; Hobfoll et al., 2018). Resources can be categorized in a number of different ways, with one dimension emphasizing the source—contextual resources are those that are external to individuals and exist in the social environment (e.g. the workplace), whereas personal resources exist within a person (Hobfoll, 2002). Accordingly, we consider schedule control to be a constructive contextual resource and sleep duration and quality to be physical personal resources (Halbesleben et al., 2014; Hobfoll, 2002; ten Brummelhuis & Bakker, 2012).

In COR theory, the loss of resources, threat of resource loss, or inability to gain resources is proposed to induce stress and lead to negative outcomes. Hobfoll et al., 2018 argue that the presence of resources makes it easier to obtain additional resources, whereas the loss of resources makes the acquisition of new resources more challenging. In this way, the presence of schedule control (i.e. a constructive contextual resource) will allow for more resources and enable patient care workers to have greater sleep duration and quality (i.e. physical personal resources) as well as improvements in their job attitudes. A lack of resources will make workers more vulnerable to further resource loss, resulting in negative outcomes (i.e. poorer job attitudes).

Typically, strain outcomes (e.g. occupational burnout) are examined in tests of COR theory, but we explore job satisfaction and turnover intentions as different outcomes of depleted resources (see Hochwarter, Laird, and Brouer (2007) and Reina, Rogers, Peterson, Byron,

and Hom (2017) for other applications of COR theory with job attitudes). For instance, employees with a lack of resources (i.e. little control over their work schedule and poor sleep) should develop more negative evaluations of their job (i.e. lower job satisfaction). Employees may also have adaptive reactions to experiencing resource deprivation and be motivated to quit their job (i.e. higher turnover intentions).

We test a temporally distributed effects model with two 6-month time lags between study variables. It is beneficial to examine temporal associations in mediation models, instead of cross-sectional associations, because mediation models are inherently time-based and the potential for common method bias to inflate relationships is reduced in temporal models (e.g. Maxwell & Cole, 2007; Podsakoff, MacKenzie, & Podsakoff, 2012; Winer et al., 2016). Taken together, we expect that patient care workers with greater schedule control at baseline will experience better sleep 6-months later, and higher job satisfaction and lower turnover intentions 12-months later.

4 | HYPOTHESES

4.1 | Schedule control and job attitudes

Schedule control is an extension of Karasek's (Karasek, 1979) notion of job control with an emphasis on 'when and where work is done rather than how it is done' (Kelly & Moen, 2007, p. 491). There is strong empirical evidence that general job control has a positive influence on employees' job attitudes (e.g. Griffeth, Hom, & Gaertner, 2000; Loher et al., 1985; Spector, 1986) and the impact of *schedule-specific* control on employee job attitudes is a growing area (Kelly & Moen, 2007). COR theory suggests that the presence of resources should lead to favorable employee outcomes (Hobfoll, 1989). Some work has begun to explore job satisfaction and turnover within the COR framework (e.g. Hochwarter et al. (2007); Reina et al. (2017)). In this study, employees who receive greater contextual resources from their work environment (i.e. have more schedule control) are expected to be more satisfied with their job and less likely to quit.

Job satisfaction represents an evaluation of favourability towards one's job (e.g. Schleicher, Hansen, & Fox, 2011). Having choice over taking vacations or days off, or the number of hours worked each week (i.e. schedule control), is likely associated with positive perceptions of one's job because it provides resources for employees and a sense of autonomy. Indeed, prior work has found that flexible work schedule arrangements are related to higher job satisfaction (e.g. Baltes, Briggs, Huff, Wright, & Neuman, 1999; Lyness et al., 2012). Therefore, we expect workers with more control over their schedule (i.e. greater contextual resources) to perceive greater satisfaction with their job.

Turnover intentions represent the extent to which someone is planning to quit their current job and are the best predictor of actual turnover (Griffeth et al., 2000). Less is known about the influence of schedule control on turnover intentions, though general job control has been linked with lower turnover intentions (e.g. Griffeth et al., 2000). Additionally, employees who participated in an intervention study aimed at establishing norms around schedule flexibility were less likely to quit (Kelly et al., 2011), so providing workers with control over their schedule may help to retain them in an organization. Employees who can

decide when they begin and end their work day, or who have the option to change their work arrangements, like switching to a part-time position (i.e. schedule control), should be less inclined to consider leaving their organization because of this resource provided by their organization. Thus, we propose that workers with greater schedule control will have lower turnover intentions.

Past research on healthcare workers has also shown that employees with greater general job control have higher job satisfaction and lower turnover intentions (e.g. Heponiemi et al., 2009; Zangaro & Soeken, 2007), and researchers have argued that increased schedule control would be particularly advantageous for patient care workers, like nurses (e.g. Cartledge, 2001), given the host of stressors they experience and their need for resource replenishment. Based on COR theory and past research, we expect that patient care workers with greater schedule control will be more satisfied with their jobs and experience lower turnover intentions one year later.

Hypothesis 1a *Schedule control measured at baseline will be positively associated with job satisfaction measured 12 months later.*

Hypothesis 1b *Schedule control measured at baseline will be negative associated with turnover intentions measured 12 months later.*

4.2 | Schedule control and sleep

According to COR theory, employees with greater contextual resources (i.e. more schedule control) should consequently gain more personal resources (i.e. longer sleep duration and higher sleep quality). Research has demonstrated that employees with greater general job control have better sleep quality outcomes that persist over time (Linton et al., 2015; Van Laethem et al., 2013). Relatedly, there is meta-analytic evidence that employees who lack control at work experience more sleep disturbances (Nixon, Mazzola, Bauer, Krueger, & Spector, 2011). Additionally, there are benefits of general job control specifically for nurses' sleep quality (Eriksen, Bjorvatn, Bruusgaard, & Knardahl, 2007; Portela et al., 2015).

Schedule control, a specific type of job control, can also be beneficial for workers' sleep duration and quality (Takahashi et al., 2012). Intervention work has shown that changes in schedule control improve information technology workers' sleep sufficiency (directly and indirectly through work–family conflict), and sleep duration (indirectly through family time adequacy) up to a year and a half after the intervention (Crain et al., 2019; Olson et al., 2015). Similarly, corporate employees who participated in an initiative promoting schedule control reported sleeping almost an hour more on work nights, compared to employees who did not participate in the initiative (Moen et al., 2011). Thus, schedule control is linked to favorable sleep outcomes. However, much of this research has been conducted with white-collar workers, so we extend this line of research to an hourly lower-wage population of patient care workers.

Schedule control may enable workers to obtain an adequate amount of sleep and may also be effective for reducing stressors. Drawing from COR theory, which suggests that acquiring resources is easier for people who have more resources to begin with, and other work that

suggests that contextual resources provided by the workplace are especially beneficial for employee sleep (Crain et al., 2018), we argue that patient care workers with greater average schedule control will have more time to engage in sleep and will have better sleep quality over time.

Hypothesis 2 *Schedule control measured at baseline will be positively associated with sleep duration and quality measured 6 months later.*

4.3 | Sleep and job attitudes

Losing resources is stressful to employees, whereas protecting and accruing resources can help to prevent experiences of stress and strain (Hobfoll, 1989). Therefore, employees with greater personal resources (i.e. sleep duration and quality) should experience lower strain and experience greater satisfaction in their job and lower intentions to quit. Minkel et al. (2012) provided evidence that people with poorer sleep have greater subjective experience of strain and negative moods. Other theoretical (e.g. Barnes, 2012; Crain et al., 2018) and empirical work (e.g. Pilcher & Huffcutt, 1996; Lee, Crain, McHale, Almeida, & Buxton, 2016) identifies how the resource of sleep influences affectivity (i.e. mood and emotions; Weiss & Brief, 2001). This work helps to explain why other studies have found that employees with poor sleep (e.g. short sleep duration and low sleep quality) report decreased job satisfaction and higher turnover intentions (e.g. Barnes, Ghumman, & Scott, 2013; Heponiemi et al., 2009; Karagozoglu & Bingöl, 2008; Litwiller et al., 2017; Scott & Judge, 2006).

We expect that patient care workers who obtain short sleep durations and have low quality sleep on average will report being less satisfied with their job and more inclined to quit their job over time due to resource loss that is characterized by greater experiences of stress and decrements in mood. Patient care workers may also attribute their poor sleep to their job (e.g. their work schedule or stressors experienced at work), thus reducing their job satisfaction and increasing their turnover intentions. We extend past work by considering both job satisfaction and turnover intentions as job attitudes that can be influenced by sleep duration and quality.

Hypothesis 3a *Sleep duration and quality measured at 6 months will be positively associated with job satisfaction measured at 12 months.*

Hypothesis 3b *Sleep duration and quality measured at 6 months will be negatively associated with turnover intentions measured at 12 months.*

4.4 | Sleep as a mediator

Taken together, COR theory and empirical research suggest that employees with more schedule control will experience more favorable job attitudes and improved sleep (e.g. Hobfoll, 1989; Lyness et al., 2012; Olson et al., 2015), and employees with better sleep will experience greater job satisfaction and lower turnover intentions (e.g. Litwiller et al., 2017; Moen et al., 2011; Tucker, Bejerot, Kecklund, Aronsson, & Åkerstedt, 2015). Some researchers have also theorized that sleep is a resource that can jointly influence and be influenced by work-related variables (Crain et al., 2018), yet, sleep duration and quality have

not been explored as linking mechanisms explaining associations between schedule control and favorable job attitudes. We expect that patient care workers with greater schedule control (i.e. more constructive contextual resources) will experience higher job satisfaction and lower turnover intentions, and that these relationships will be partially explained by having longer sleep duration and higher sleep quality (i.e. more physical personal resources).

Hypothesis 4a *The association between schedule control measured at baseline and job satisfaction measured 12 months later will be partially mediated by sleep duration and quality measured at 6 months.*

Hypothesis 4b *The association between schedule control measured at baseline and turnover intentions measured 12 months later will be partially mediated by sleep duration and quality measured at 6 months.*

5 | METHODS

5.1 | Participants

The present study used a subset of the data from the CDC- and NIH-funded Work, Family and Health Study (WFHS), which was developed to assess how workplace practices influence work, family, and well-being outcomes for employees and their families (Bray et al., 2013; Kossek, Hammer, Kelly, & Moen, 2014). Participants included hourly patient care workers, primarily CNAs and nurses, in long-term nursing home facilities. The worksites (n = 30) were located throughout New England. Eligible participants were employees who were scheduled to work at least 22.5 hours per week in direct patient care roles. Night shift workers were excluded from the study due to an inability for research personnel to conduct study procedures and because there were fewer back-up workers available to cover for participants during the night shift.

5.2 | Procedure

Sixty-minute Computer Assisted Personal Interviews (CAPI) were administered in-person by trained field interviewers between the years 2010 and 2013. Data were collected from participants over three time intervals (at baseline n = 1,499–1,524; 6-months n = 1,264–1,273; and 12-months n = 1,081–1,083; final sample size = 1,497). Participants were compensated $20 for completion of the CAPI interview at each time point.

5.3 | Measures

5 3.1 | Schedule control—Schedule control represents the extent to which employees can decide when and how much they work. An 8-item measure of work-related schedule control was used (Thomas & Ganster, 1995). After conducting a confirmatory factor analysis,[1] this measure was shortened to a 6-item measure (Cronbach's α = .64), which

[1]A single-factor confirmatory factor analysis (CFA) was performed in Mplus Version 7.4 to assess the internal structure of the 8-item schedule control measure. The following fit statistics and criteria were considered: a non-significant χ^2 statistic, CFI greater than or equal to .95, TLI greater than or equal to .95, RMSEA less than or equal to .06, and SRMR less than or equal to .08 (Hu & Bentler, 1999; Yu, 2002). Initially, only SRMR provided evidence of model fit, and the standardized factor loadings for four out of the eight items were low (i.e., below .40). To address these issues, modification indices were assessed and changes were implemented based on theory. We decided to remove item 5 ("how much choice do you have over doing some of your work at home or at another

asked participants to think about how much schedule control they have (e.g. 'How much choice do you have over when you begin and end each work day?'; 'How much choice do you have over when you take vacations or days off?'). Response options range from 1 to 5 (1 = *very little*; 5 = *very much*), with higher scores indicating greater schedule control.

5.3.2 | Sleep duration—Sleep duration was measured using two items from the Pittsburg Sleep Quality Index (PSQI; Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). Sleep duration items included: 'Over the past four weeks, what time did you usually turn the lights off and go to sleep?' and 'Over the past four weeks, what time did you usually get out of bed?'. Participants' typical sleep duration was calculated in hours.[2]

5.3.3 | Sleep insufficiency—Sleep insufficiency is a measure of sleep quality, and was measured with the following single-item (Buxton et al., 2012): 'How often during the past four weeks did you get enough sleep to feel rested upon waking up?'. Scores range from 1 to 5 (1 = *very often*; 5 = *never*), in which higher scores represent greater sleep insufficiency (i.e. poorer sleep sufficiency).

5.3.4 | Insomnia symptoms—Insomnia symptoms are an additional measure of sleep quality and were measured with two items from the PSQI (Buysse et al., 1989): 'During the past four weeks, how often could you not get to sleep within 30 min?' and 'During the past four weeks, how often did you wake up in the middle of the night or early morning?'. Participants rated both items on a 1–4 scale (1 = *Never*; 2 = *Less than once a week*; 3 = *Once or twice a week*; 4 = *Three or more times a week*), with higher scores reflecting more frequent insomnia symptoms.

5.3.5 | Job satisfaction—Job satisfaction assesses the extent to which employees are content in their current job. The three-item Michigan Organizational Assessment Questionnaire Job Satisfaction Subscale (Cammann, Fichman, Jenkins, & Klesh, 1979; Cronbach's α = .83) was used to measure employees' satisfaction in their job (e.g. 'In general, you like working at your job'). Response options range from 1 to 5 (1 = *strongly disagree*; 5 = *strongly agree*), with higher scores indicating higher job satisfaction.

5.3.6 | Turnover intentions—Turnover intentions assess the extent to which employees are considering quitting their job. Turnover intentions were measured with Boroff and Lewin's (1997) two-item measure (e.g. 'You are seriously considering quitting [name of company] for another employer'). Response options range from 1 to 5 (1 = *strongly disagree*; 5 = *strongly agree*), with higher scores indicating higher intentions to quit.

5.3.7 | Control variables—Control variables were selected because they theoretically could influence spurious relationships between variables of interest (Spector & Brannick,

location, instead of at your organization?") and item 7 ("How much choice do you have over the amount or times you take work home with you?"), as these had the highest covariance, and were both related to working from home, which is not relevant to patient care workers. Thus, we believe that the reason participants were responding differently to these two items is because they were both uncommon schedule control options for them (i.e., there was shared error variance). For these reasons, both item 5 and item 7 were dropped.

[2]Reports of 15 hours of sleep or more were determined as outliers and removed from analyses. The same significant direct and indirect effects were found when the sleep duration variable with outliers included was used in analyses.

2011). Therefore, gender, race, and age were selected as demographic controls, as past work has demonstrated relationships among these variables and sleep (e.g. Adenekan et al., 2013; Burgard & Ailshire, 2013; Neikrug & Ancoli-Israel, 2010). Additionally, the effect of the larger WFHS intervention was also controlled for, as the intervention was not a substantive variable of interest for the present study.

5.4 | Analysis plan

Temporally distributed between-person associations and mediation analyses were tested among baseline reports of schedule control (i.e. predictor), 6-month reports of sleep duration, sleep insufficiency, and insomnia symptoms (i.e. mediators), and 12-month reports of job satisfaction and turnover intentions (i.e. outcomes), controlling for gender, race, age and the intervention indicator. We use a non-change approach to study temporal mediation in which time-invariant variables are considered (i.e. variables that are measured at distinct time points; Roth & MacKinnon, 2012). The primary benefit of this approach, compared to cross-sectional (i.e. atemporal) mediation, is that it reduces the potential for false relationships among variables to be detected due to common method bias (Podsakoff et al., 2012). Researchers have also called attention to the inappropriateness of testing mediation models with cross-sectional data, given that mediation models are considered “process models” and are intended to examine variables in a temporal sequence (e.g. Maxwell & Cole, 2007; Winer et al., 2016).

Participants were nested within 30 distinct extended care facilities, so intraclass correlation coefficients (ICCs) were computed in SAS Version 9.4 to determine whether multilevel modeling should be used to take into account differences by the facilities. The ICC values ranged from 0 to 0.05, with an average of 0.02 across study variables, suggesting little or no variance at the facility level. To simplify the model structure, the path analysis ignored the facility level. A fully saturated path model was used to test all hypotheses in MPlus Version 7.4. Indirect effects (i.e. mediation) were assessed using bias-corrected bootstrapped estimates based on 1,000 bootstrapped samples. Statistical significance was determined by 95% bias-corrected asymmetrical confidence intervals (CIs) that do not contain zero or change sign (e.g. a negative to positive value).

6 | RESULTS

6.1 | Descriptive statistics

Participants were primarily white (67%) women (92%), with an average age of 38.5 years (SD = 12.48). Participants reported experiencing moderate control over their work schedules (M = 2.90; SD = 0.79). On average, participants reported sleeping for 7 hours and 16 minutes (SD = 1 hour and 28 minutes), sometimes experiencing sleep insufficiency (M = 2.99; SD = 0.94), and experiencing insomnia symptoms approximately 1–2 times per week (M = 2.84; SD = 0.81). On average, participants were satisfied with their job (M = 4.13; SD = 0.64) and had low turnover intentions (M = 2.18; SD = 1.04). See Table 1 for all descriptive statistics and correlations among variables.

6.2 | Schedule control, job satisfaction and turnover intentions

Greater baseline schedule control was significantly associated with greater job satisfaction measured 12 months later ($B = 0.12$, $SE = 0.03$, $p < .001$) and lower turnover intentions measured 12 months later ($B = -0.22$, $SE = 0.04$, $p < .001$), controlling for all other variables (i.e. substantive and control variables) in the model (see Table 2). Therefore, hypotheses 1a and 1b were supported.

6.3. | Schedule control and sleep

Baseline schedule control was significantly associated with greater sleep duration measured 6 months later ($B = 0.15$, $SE = 0.05$, $p < .01$), lower sleep insufficiency measured 6 months later ($B = -0.08$, $SE = 0.04$, $p < .05$), and fewer insomnia symptoms measured 6 months later ($B = -0.06$, $SE = .03$, $p < .05$), controlling for all other variables in the model (see Table 2). Therefore, hypothesis 2 was supported.

6.4 | Sleep, job satisfaction and turnover intentions

Sleep insufficiency measured at 6 months was significantly associated with lower job satisfaction measured at 12 months ($B = -0.05$, $SE = 0.02$, $p < .05$), controlling for all other variables in the model (see Table 2). However, no other measures of sleep measured at 6 months were significantly associated with job satisfaction measured at 12 months (duration: $B = 0.00$, $SE = 0.02$, $p = .79$; insomnia symptoms: $B = 0.01$, $SE = 0.03$, $p = .62$). Insomnia symptoms measured at 6 months were significantly associated with higher turnover intentions measured at 12 months ($B = 0.09$, $SE = 0.04$, $p < .05$), controlling for all other variables in the model (see Table 2). No other measures of sleep measured at 6 months were significantly associated with turnover intentions measured at 12 months (duration: $B = 0.02$, $SE = 0.02$, $p = .47$; insufficiency: $B = 0.05$, $SE = 0.03$, $p = .14$). Therefore, hypotheses 3a and 3b were partially supported.

6.5 | Indirect effects

There was a significant, though small, indirect effect of baseline schedule control on job satisfaction measured 12 months later through sleep insufficiency measured at 6 months (indirect effect = 0.004, 95% CI [0.000, 0.011]). No other mediating effects of sleep duration or quality measured at 6 months were detected in the associations between baseline schedule control and job satisfaction or turnover intentions measured 12 months later. The association between schedule control and job satisfaction was therefore partially mediated by employees' perceptions of being well-rested (i.e. sleep sufficiency), but not by other sleep variables. Thus, hypothesis 4a was partially supported, but should be interpreted provisionally due to the small indirect effect, and hypothesis 4b was not supported. See Figure 1 for depiction of results.

6.6 | Additional Analyses

In response to feedback received from journal reviewers, additional analyses were performed to account for time in varying ways. Specifically, we tested our hypotheses in a cross-sectional baseline model and a change over time model. Similar to the hypothesized temporally distributed effects model, fully saturated path models were used in MPlus

Version 7.4 and indirect effects were assessed using bias-corrected bootstrapped estimates based on 1,000 bootstrapped samples.

6.6.1 | Baseline model—To address potential concerns about our results being due to stability of the mediator and outcome variables over time, we tested our model by analyzing the associations among the study variables measured at baseline, with all control variables included (see Table 3). Unlike the hypothesized model, sleep insufficiency at baseline was not significantly associated with job satisfaction at baseline ($B = -0.03$, $SE = 0.02$, $p = 0.08$), and insomnia symptoms at baseline were not significantly associated with turnover intentions at baseline ($B = 0.02$, $SE = 0.03$, $p = .63$). Two new significant associations were detected at baseline that were not present in the hypothesized temporal model. First, there was a significant positive association between sleep insufficiency at baseline and turnover intentions at baseline ($B = 0.08$, $SE = 0.03$, $p < .01$) and a significant indirect effect of baseline sleep insufficiency in the association between baseline schedule control and baseline turnover intentions (indirect effect = −0.011, 95% CI [−0.024, −0.004]). All other significant results from the hypothesized temporally distributed effects model were comparable to the baseline model. Thus, our temporal model does not simply mimic the patterns of associations at baseline.

6.6.2 | Change over time model—Finally, we tested a change over time model in which earlier levels of the mediator and outcome variables (i.e. baseline sleep duration, baseline sleep insufficiency, baseline insomnia symptoms, baseline job satisfaction, and baseline turnover intentions) were included as control variables. After accounting for baseline levels of sleep duration, sleep quality, job satisfaction, and turnover intentions, no hypothesized associations were significant (see Table 4).

7 | DISCUSSION

We interpret our results in light of the findings from the hypothesized temporally distributed effects model and comment on the results from the baseline and change over time analyses in the limitations and additional avenues for future research section below. Results from the hypothesized temporally distributed effects model revealed that patient care workers with more schedule control reported greater job satisfaction, lower turnover intentions, longer sleep duration, more sufficient sleep, and fewer insomnia symptoms, suggesting that schedule control is an important contextual resource for improving work outcomes and sleep. Workers who experienced fewer insomnia symptoms reported lower intentions to quit 6 months later, and workers who experienced more sufficient sleep reported higher job satisfaction 6 months later. Sleep sufficiency partially mediated the association between schedule control and job satisfaction, but this effect was small and no other sleep variables acted as mediators. Otherwise, the between-person associations we find in the temporally distributed effects model are consistent with past work, so this paper serves as a replication in a sample of patient care workers, while also extending the current literature to evaluate sleep as a novel linking mechanism between schedule control and work outcomes. Results from the hypothesized model provide some support for COR theory, as the presence of resources (i.e. schedule control) was associated with additional resources (i.e. sleep) and facilitated beneficial work outcomes beyond employee strain. Additionally, we addressed

calls to examine both sleep quantity and sleep quality (Barnes, 2012; Crain et al., 2018; Litwiller et al., 2017) and considered the association between sleep duration and turnover intentions, which has not been explored in published research to date (Litwiller et al., 2017). Studying low-wage hourly patient care workers in extended care facilities is another contribution of this paper.

There was a small indirect effect of sleep insufficiency in the association between schedule control and job satisfaction. This suggests that perceptions of being well-rested is a weak explanatory variable in the association between schedule control and job satisfaction. Other mediators should be evaluated as they may have stronger mediating effects and further our knowledge of the links between schedule control and work outcomes. For example, employees who do not feel well-rested when they wake up may in turn experience more sleepiness while they are at work. Sleepiness has been theorized to relate to job attitudes and withdrawal behaviors, like turnover (Mullins, Cortina, Drake, & Dalal, 2014). Alternatively, employees with less control over their schedule may have more occupational burnout, characterized by feelings of exhaustion due to work, and then feel less rested upon awakening (Kristensen, Borrtiz, Villadsen, & Christensen, Kristensen, Borritz, Villadsen, & Christensen, 2005). Therefore, sleepiness and occupational burnout may act as additional mediators alongside sleep insufficiency in the association between schedule control and job satisfaction. In addition, no mediating effects of sleep were found in the association between schedule control and turnover intentions. Schedule control is a contextual resource provided by employers, so workers may be inclined to reciprocate by remaining in their organization (in line with the norm of reciprocity principle in social exchange theory; Blau, 1964). Thus, indicators of social exchange quality (e.g. perceived organizational support) could be explored as different mediators between schedule control and turnover intentions.

There was a relatively strong negative correlation between job satisfaction and turnover intentions in this sample (−.51), but the associations of sleep with these work variables were not parallel. Insomnia symptoms measured at 6 months were associated with greater turnover intentions measured at 12 months, meaning that workers who had trouble falling and/or staying asleep reported that they were considering quitting their current job for another employer, but insomnia symptoms were not related to how satisfied workers were in their job 6 months later. It is possible that patient care workers may have trouble falling and/or staying asleep due to work-related rumination, which could lead to a consideration of alternative organizations and jobs, even if they are satisfied with their current direct patient care work. Additionally, the association between schedule control and turnover intentions was not mediated by insomnia symptoms or the other two measures of sleep (i.e. duration and insufficiency). Future work could explore why there are discrepant associations among sleep characteristics and work-related variables, in addition to other mediators linking schedule control and turnover intentions.

7.1 | Practical implications

Findings from this study have the potential to inform workplace interventions and policy. Allowing workers some discretion in deciding when they begin and end their shifts, when they take days off or vacation time, and/or their status as a full- or part-time employee is

likely to benefit sleep and work outcomes. The turnover rate is the highest for patient care workers who have been working in the healthcare industry for less than one year (Nursing Solutions, Inc., 2017), so providing schedule control options to workers when they begin their careers, rather than making these contingent on tenure (i.e. a seniority system), may be especially impactful. Conversely, patient care workers in extended care facilities may have less access to schedule control compared to other occupations due to the demands of their job and the highly-regulated nature of the industry.

When intervening on schedule control is not feasible, or when workers do not use schedule control options, sleep quality could be targeted to improve workers' job satisfaction and reduce turnover intentions. Organizations could provide training to supervisors on sleep leadership behaviors, which involve asking employees about their sleep habits and encouraging them to get adequate sleep (Gunia, Sipos, LoPresti, & Adler, 2015). Structural changes, such as providing on-site nap rooms for workers to use during breaks or between shifts, could also be beneficial. These strategies could help to establish new norms and begin to shift the organizational culture in patient care occupations by signaling that sleep is valued. Implementing well-publicized policy change and organizational culture change initiatives related to schedule control and sleep for patient care workers could have a positive impact on workers' sleep and attitudes towards their work, which would be beneficial for the workers, their patients, and the organizations that they work for.

7.2 | Limitations and additional avenues for future research

Characteristics of the sample could explain why there were no significant associations between sleep duration and work-related outcomes. For instance, although 34.5% of the sample did not meet the minimum recommended sleep duration of at least seven hours per night, the average sleep duration for this sample was over seven hours (Watson et al., 2015). Participants in this sample were also satisfied with their work and did not have high intentions to quit. Relatedly, another limitation is that less than 2% of the participants in our sample worked a night shift schedule, as night shift workers were excluded from the study for logistical reasons. Night shift workers may have shorter and/or poorer quality sleep because they sleep during the daytime when the circadian system promotes wakefulness, making it more difficult to sleep. Alternatively, night shift workers may choose to sleep less during the day than they would during evening hours to spend time with family and friends or engage in other responsibilities (e.g. hobbies, appointments). Future research would benefit from investigating the potentially unique experiences night shift workers have related to schedule control, sleep, job satisfaction, and turnover intentions.

Further, despite the widespread use of COR theory in stress-related papers, it has been criticized for its broad definition of resources (e.g. Halbesleben et al., 2014). In response to this, Halbesleben et al. (2014) argue that researchers should consider how participants value resources, rather than just measuring their availability. For instance, if an employee does not value having schedule control, then even if they believe they can exert control over when they come to work, they may choose not to (i.e. the resource of schedule control would not be utilized because it is not valued). Further, even when resources are available and valued, they may not be used by employees because of organizational norms and/or stigmas

associated with the use of benefits. For example, if an organization offers flexible scheduling options, but does not have a culture that supports the use of these benefits (e.g. people are discouraged from modifying their work schedule or going on vacations), employees may refrain from using this resource. We did not measure perceived value of resources in this paper, but believe this is an important area for future research to explore.

Although a contribution of this study is the exploration of low-wage hourly workers in patient care roles, we assume that the experiences of these workers is distinct from those in white-collar professional level jobs because of their lower wages and unique work-related stressors. Therefore, an important next step would be to conduct comparison studies that directly examine group differences. For example, Kossek and Lautsch (2018) describe how access to and outcomes of schedule control differ across upper-, middle-, and lower-level occupational groups. Future work could consider occupational-level (e.g. supervisors compared to employees, high-income workers compared to low-income workers) as a moderator between schedule control, sleep, and work-related outcomes.

Methodologically, all measures were self-reported, so it is possible that some of the effects we found could be due to common method bias, though the use of 6-month time-lags helps to mitigate this potential issue (e.g. Podsakoff et al., 2012). Future work would benefit from using objective indicators of sleep, such as with actigraphs, which are wrist-watch devices that have validity evidence for distinguishing between periods of wake and sleep (e.g. Ancoli-Israel et al., 2015; Marino et al., 2013). Measuring actual voluntary turnover, rather than turnover intentions, would also be advantageous. The use of 6-month time lags allowed us to test between-person associations over time and reduce potential common method bias, but it is possible that some effects were not detected due to the length of the time lags. Although schedule control and job attitudes are less likely to vary over a short period of time, sleep likely varies day-to-day, so future research could consider how work-related resources, sleep, and work outcomes are related at the daily-level. This would be another way to investigate the role of time in COR theory, as suggested by Hobfoll et al. (2018). Finally, questions about average sleep duration and quality were based on the previous four weeks, while the time lags were 6 months long. Although a four-week time frame reduces the potential for inaccurate recall, it would benefit future work to use a consistent time frame in measures and time lags.

Finally, of note is that we did not find comparable results when different analytical approaches were used to account for time, so our results and conclusions should be interpreted cautiously. We tested the following: (a) our hypothesized temporally distributed effects model, (b) a cross-sectional baseline model, and (c) a change over time model with baseline levels of the outcome variables controlled for. In the temporally distributed effects model, we found significant between-person associations, such that more schedule control at baseline was associated with greater sleep duration and sleep quality 6 months later, and better sleep quality was associated with more favorable job attitudes 12 months later. However, when all associations were assessed cross-sectionally at baseline, some of these associations were no longer significant and other new associations emerged. When testing a change over time model, no previously significant effects were retained. The amount of schedule control patient care workers experienced at baseline did not predict changes in their

sleep duration, sleep quality, or job attitudes over time. Similarly, sleep duration and sleep quality did not predict job satisfaction or turnover intentions after accounting for baseline sleep and job attitudes.

There are a few potential explanations for the significant temporally distributed associations but not significant baseline or change associations. First, it may take time for relationships among schedule control, sleep, and job attitudes to manifest. Schedule control may not act as an immediate resource to be associated with workers' sametime sleep or job attitudes, but may benefit workers' sleep and job attitudes later. Second, our discrepant results may relate to the proportion of shared and unique variance in the outcome variables between the time points. There were moderate to strong correlations among each outcome variable across time points (i.e. the correlation between baseline and 6-month sleep measures was .55 for sleep duration, .42 for sleep insufficiency, and .47 for insomnia symptoms; the correlation between baseline and 12-month job attitude measures was .55 for job satisfaction and .59 for turnover intentions). Therefore, because some portion of the unique variance in sleep was also highly correlated with earlier reports of sleep, after controlling for baseline sleep, we were not able to detect effects of schedule control on changes in sleep. A similar phenomenon might have occurred for the effects of schedule control on job attitudes as well. It is also plausible that these processes had already been occurring prior to the start of the data collection, preventing further changes to have occurred and been detected in this study. Finally, these analytical strategies are conceptually distinct and have different purposes. Specifically, results from temporally distributed effects models describe associations among variables across time lags and reduce the potential for associations to be attributed to common method bias, whereas results from cross-sectional models identify associations among variables within a single, static time-point, yet are susceptible to inflated relationships due to common method bias (e.g. Podsakoff et al., 2012). This is in contrast to change models, in which earlier levels of outcome variables are accounted for, as these demonstrate the effects of independent variables on changes in outcome variables over time. Taken together, our results suggest that it is not static associations or change over time, but unique variance at each temporally distributed time point that explains the relationship between schedule control, sleep, and job attitudes.

This study sheds light on broader issues related to how analytical choices influence conclusions that are drawn in research, a dilemma that has been noted in other work (e.g. Silberzahn et al., 2018). We agree with others who have argued that being transparent about the research process (e.g. Silberzahn et al., 2018), including reporting null and unexpected results (e.g. Landis, James, Lance, Pierce, & Rogelberg, 2014; Landis & Rogelberg, 2013), are best practices for advancing science. We find that the inconsistent results between different analytic approaches are informative and interesting because they highlight the nuances of accounting for time. Researchers in the organizational sciences and occupational stress literatures have discussed the complexities of modeling time in longitudinal studies (e.g. Ford et al., 2014; Spector & Pindek, 2015; Wang et al., 2016). For example, Ford et al.'s (2014) meta-analysis demonstrated how the harmful effects of occupational stressors develop over time. However, these authors excluded schedule-related stressors (e.g. a lack of schedule control) from their paper, so research in this area is warranted. Further, longitudinal study designs help address research questions related to causal priority, future prediction,

change, and temporal external validity, but there are conceptual disagreements in whether longitudinal research requires a consideration of change over time and whether it requires intra-individual comparisons (Wang et al., 2016). As shown in this paper, these decisions can alter research results and the subsequent conclusions that are drawn.

8 | CONCLUSION

Patient care workers with greater control over their work schedule at baseline reported greater sleep duration and sleep quality 6 months later, and higher job satisfaction and lower turnover intentions 12 months later. Additionally, sleep sufficiency was associated with higher job satisfaction 6 months later, and fewer insomnia symptoms were associated with lower turnover intentions 6 months later. Sleep sufficiency partially mediated the association between schedule control and job satisfaction. This work provides some support for the application of COR theory to study job attitudes. However, these results were not replicated in a cross-sectional baseline model or a change over time model. Therefore, although this study has implications for current issues surrounding patient care workers' low job satisfaction, high turnover rates, and poor sleep in the growing extended care industry, it also highlights the nuances of how using different analytical approaches with longitudinal data can influence conclusions that are made.

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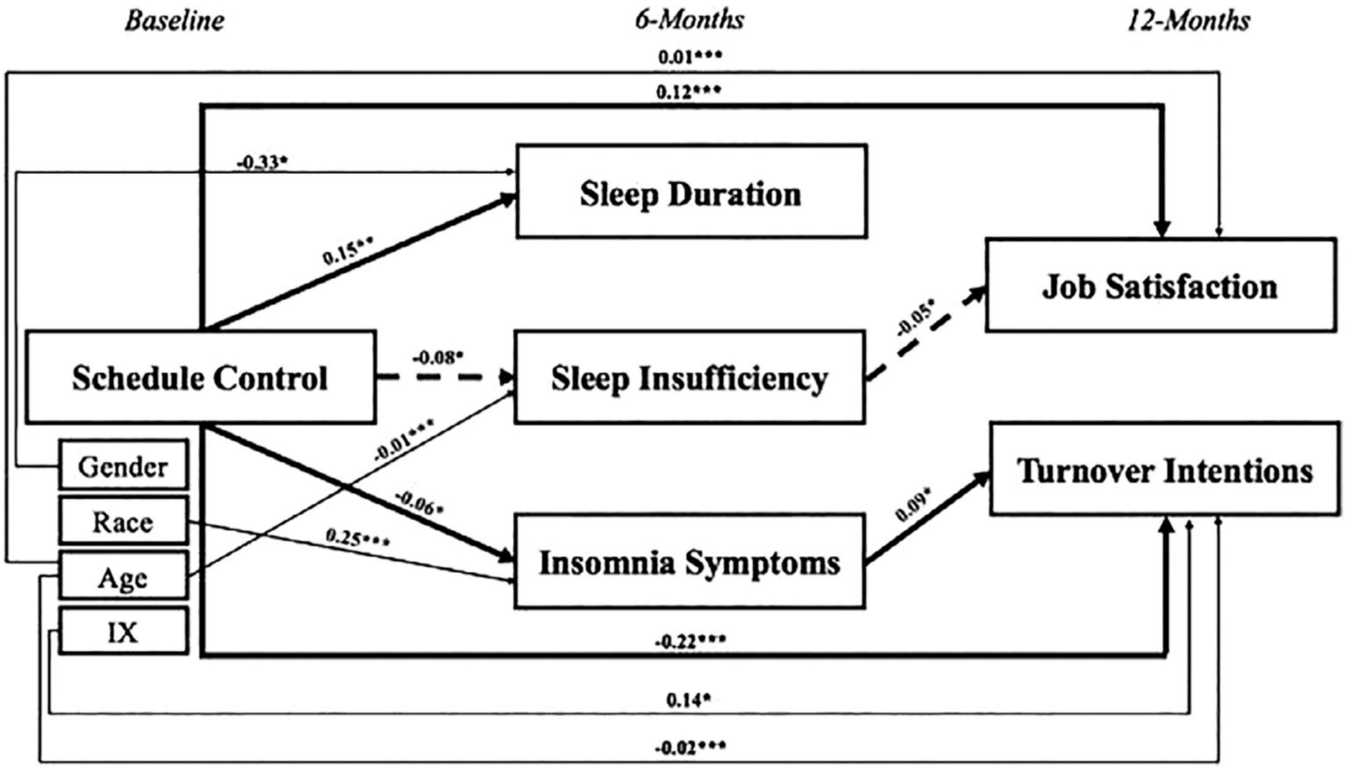

FIGURE 1.

Empirical results of the hypothesized path model. Gender (0 = Female, 1 = Male); Race (0 = Other, 1 = White); Intervention Indicator (IX; 0 = Control, 1 = Intervention). Covariances (among schedule control, gender, race, age, and intervention indicator, among sleep variables, and between job satisfaction and turnover intentions) were included in the path analysis but are not shown for parsimony. Solid arrows represent significant direct effects and dashed arrows represent significant indirect effects. *$p < .05$; **$p < .01$; ***$p < .001$

TABLE 1

Descriptive statistics and correlations among study variables

Variable	*N*	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1. Gender (B)	1,524	0.08	0.27	-									
2. Race (B)	1,524	0.67	0.47	−.14**	-								
3. Age (B)	1,522	38.52	12.48	−.05	.11**	-							
4. Intervention indicator (B)	1,524	0.48	0.50	−.04	.02	−.04	-						
5. Schedule control (B)	1,499	2.90	0.79	.00	.08**	.05	.06*	-					
6. Sleep duration (6 m)	1,264	7.26	1.47	−.06*	.03	−.01	−.04	.08**	-				
7. Sleep insufficiency (6 m)	1,273	2.99	0.94	−.02	−.01	−.17**	−.00	−.08**	−.22**	-			
8. Insomnia symptoms (6 m)	1,272	2.84	0.81	−.06*	.14**	−.03	−.00	−.05	−.04	.22**	-		
9. Job satisfaction (12 m)	1,083	4.13	0.64	−.03	.05	.20**	−.06	.16**	.04	.10**	.01	-	
10. Turnover intentions (12 m)	1,081	2.18	1.04	.03	−.08**	−.27**	.07*	−.19**	−.02	.11**	.09*	−.51**	-

Note: Gender (0 = Female, 1 = Male); Race (0 = Other, 1 = White); Intervention indicator (0 = Control, 1 = Intervention). (B) = Baseline; (6 m) = 6-months; (12 m) = 12-months. *N* = Sample size. *M* = mean (i.e. average) value. *SD* = standard deviation.

* $< p < .05$.

** $p < .01$.

TABLE 2

Direct regression effects from the hypothesized temporally distributed effects model

	Outcomes									
	Sleep duration (6 m)		**Sleep insufficiency (6 m)**		**Insomnia symptoms (6 m)**		**Job satisfaction (12 m)**		**Turnover intentions (12 m)**	
Predictor	***B***	***SE B***	***B***	***SE B***	***B***	***SE B***	***B***	***SE B***	***B***	***SE B***
Race	0.05	0.09	0.04	0.05	0.25***	0.05	0.03	0.04	−0.11	0.06
Gender	−0.33*	0.15	−0.07	0.10	−0.11	0.09	−0.04	0.07	0.10	0.11
Age	−0.00	0.00	−0.01***	0.00	−0.00	0.00	0.01***	0.00	−0.02***	0.00
Intervention indicator	−0.14	0.08	−0.01	0.05	−0.01	0.04	−0.07	0.04	0.14*	0.06
Schedule control (B)	0.15**	0.05	−0.08*	0.04	−0.06*	0.03	0.12***	0.03	−0.22***	0.04
Sleep duration (6 m)							0.00	0.02	0.02	0.02
Sleep insufficiency (6 m)							−0.05*	0.02	0.05	0.03
Insomnia symptoms (6 m)							0.01	0.03	0.09*	0.04
Model R^2	0.01		0.03		0.03		0.07		0.12	

Note: Gender (0 = Female, 1 = Male); Race (0 = Other, 1 = White); Intervention indicator (0 = Control, 1 = Intervention). (B) = Baseline; (6 m) = 6-months; (12 m) = 12-months. Sample size range: 1,081–1,524.

* $< p < .05$.

** $p < .01$.

*** $p < .001$.

TABLE 3

Direct regression effects from the baseline model

	Outcomes									
	Sleep duration (B)		**Sleep insufficiency (B)**		**Insomnia symptoms (B)**		**Job satisfaction (B)**		**Turnover intentions (B)**	
Predictor	***B***	***SE B***	***B***	***SE B***	***B***	***SE B***	***B***	***SE B***	***B***	***SE B***
Race	0.22 *	0.08	0.09	0.05	0.24 ***	0.05	0.05	0.03	−0.09	0.05
Gender	−0.20	0.16	0.00	0.09	−0.05	0.08	−0.03	0.06	0.07	0.09
Age	−0.01 *	0.00	−0.01 ***	0.00	−0.00	0.00	0.01 ***	0.00	−0.01 ***	0.00
Intervention indicator	−0.03	0.08	0.01	0.05	−0.04	0.04	−0.10 **	0.03	0.18 ***	0.05
Schedule control (B)	0.15 **	0.05	−0.14 ***	0.03	−0.06 *	0.03	0.19 ***	0.02	−0.31 ***	0.03
Sleep duration (B)							0.00	0.01	0.00	0.02
Sleep insufficiency (B)							−0.03	0.02	0.08 **	0.03
Insomnia symptoms (B)							−0.02	0.02	0.02	0.03
Model R^2	0.02		0.04		0.02		0.09		0.11	

Note: Gender (0 = Female, 1 = Male); Race (1 = White, 0 = Other); Intervention indicator (0 = Control, 1 = Intervention). (B) = Baseline. Sample size range: 1,499–1,524.

* $< p < .05$.

** $p < .01$.

*** $p < .001$.

TABLE 4

Direct regression effects from the change over time model

	Outcomes									
	Sleep duration (6 m)		**Sleep insufficiency (6 m)**		**Insomnia symptoms (6 m)**		**Job satisfaction (12 m)**		**Turnover intentions (12 m)**	
Predictor	***B***	***SE B***	***B***	***SE B***	***B***	***SE B***	***B***	***SE B***	***B***	***SE B***
Race	−0.04	0.08	−0.00	0.05	0.14**	0.04	−0.02	0.03	−0.02	0.06
Gender	−0.17	0.12	−0.11	0.09	−0.11	0.08	−0.00	0.06	0.02	0.10
Age	−0.00	0.00	−0.01**	0.00	0.00	0.00	0.00**	0.00	−0.01***	0.00
Intervention indicator	−0.13	0.07	−0.02	0.05	0.00	0.04	−0.03	0.03	0.08	0.05
Sleep duration (B)	0.55***	0.03	−0.06**	0.02	0.01	0.02	0.00	0.01	0.02	0.02
Sleep insufficiency (B)	−0.03	0.04	0.36***	0.03	0.07**	0.02	0.00	0.02	−0.02	0.03
Insomnia symptoms (B)	0.00	0.05	0.07*	0.03	0.42***	0.03	−0.03	0.02	0.09*	0.04
Job satisfaction (B)	−0.05	0.06	−0.05	0.05	0.02	0.04	0.44***	0.03	−0.19***	0.05
Turnover intentions (B)	−0.03	0.04	0.03	0.03	0.08**	0.03	−0.11***	0.02	0.50***	0.04
Schedule control (B)	0.07	0.05	0.00	0.03	0.00	0.03	−0.00	0.02	−0.04	0.04
Sleep duration (6 m)							0.01	0.02	−0.01	0.02
Sleep insufficiency (6 m)							−0.02	0.02	0.02	0.03
Insomnia symptoms (6 m)							0.04	0.02	−0.00	0.04
Model R^2	0.31		0.24		0.20		0.34		0.38	

Note: Gender (0 = Female, 1 = Male); Race (0 = Other, 1 = White); Intervention indicator (0 = Control, 1 = Intervention). (B) = Baseline; (6 m) = 6-months; (12 m) = 12-months. Sample size range: 1,081–1,524.

* $< p < .05$.

** $p < .01$.

*** $p < .001$.