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Schedule control and nursing home quality: exploratory evidence of a psychosocial predictor of resident care

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Abstract

Aims—To examine if nursing homes' quality of care was predicted by schedule control (workers' ability to decide work hours), independently of other staffing characteristics.

Methods—Prospective ecological study of 30 nursing homes in New England. Schedule control was self-reported via survey in 2011–2012 (n=1,045). Quality measures included the prevalence of decline in activities of daily living (ADL), residents' weight loss, and pressure ulcers, indicators systematically linked with staffing characteristics. Outcomes data for 2012 were retrieved from [Medicare.gov](http://www.Medicare.gov).

Results—Robust Linear Regressions showed that higher schedule control predicted lower prevalence of pressure ulcers ($\beta=-0.51$, $p<0.05$). This association was independent of staff mix, staffing ratios, job satisfaction and turnover intentions.

Conclusions—Higher schedule control might enhance the planning and delivery of strategies to prevent or cure pressure ulcers. Further research is needed to identify potential causal mechanisms by which schedule control could improve quality of care.

Keywords

job flexibility; pressure ulcers; nursing home quality; staffing mix

Systematic reports have concluded that nursing homes with higher staff mix (i.e., more licensed-to-unlicensed workers) or higher licensed staff ratios (i.e., more licensed hours per resident day relative to the number of unlicensed hours per resident day¹) are linked with better quality of care, as reflected in outcomes such as lower prevalence of pressure ulcers, decline in activities of daily living and residents' weight loss (Feng, Katz, Intrator, Karuza, & Mor, 2005; Rantz et al., 2004). Nonetheless, resident care is also influenced by the psychosocial work environment, expressed in organizational structures and leadership styles that promote direct-care workers' participation and collective decisions, teamwork and organizational commitment (Barry, Brannon, & Mor, 2005; Bishop et al., 2008; Yeatts & Cready, 2007; Zhang, Punnett, Gore, & The CPH-NEW Research Team, 2012). Although some studies have shown links between time arrangements and nursing home quality indicators (Burgio, Fisher, Fairchild, Scilley, & Hardin, 2004) or hospital patient outcomes (Trinkoff et al., 2011), fewer studies have examined the potential contribution of schedule control (e.g. ability to decide over work hours) to nursing home quality.

Work-time arrangements at nursing homes are influenced by psychosocial factors such as work-family supportive policies and practices (Berkman, Buxton, Ertel, & Okechukwu, 2010) as well as staffing ratios (Horn, Buerhaus, Bergstrom, & Smout, 2005; Mueller et al., 2006). Inflexible schedules have been found not only to be detrimental to worker's well-being (Joyce, Pabayo, Critchley, & Bamba, 2010), but also with worse organizational outcomes such as lower job satisfaction, and higher turnover intentions (Moen, Kelly, & Hill, 2011). Organizational policies and practices that limit workers' ability to decide about their work hours may affect the quality of their performance, as it affects time-related resources required to plan, execute and cope with job demands (Kossek, Barber, & Winters, 1999). Though most evidence regarding loss of productivity and inflexible schedules have been found for "white-collar" industries, it is likely that the same explanatory principles apply for the direct-care workforce, whose duties involve planning and dealing with face-to-face activities required to provide care to the elderly. Low schedule control has also been linked with harmful spillover effects on spouses and children (Grzywacz, Almeida, & McDonald, 2002). These spillover effects, precisely, raise the possibility that schedule control could also influence the health of nursing home residents.

The aim of this brief report was to test if nursing homes where workers reported higher schedule control were also facilities with better resident care, after accounting for other correlated staff and organizational factors such as staff mix, staffing ratios, job satisfaction and turnover intentions. We examined resident-care indicators that have been systematically linked with staffing characteristics such as pressure ulcers, decline in functional status and weight loss (Bostick, Rantz, Flesner, & Riggs, 2006).

¹For example, 10 licensed hours per 20 unlicensed would yield a staffing ratio of 0.5, whereas the same 10 licensed hours relative to 30 unlicensed would result in a staffing ratio of 0.33.

Method

Participants

The study included direct-care employees who worked at least 24 hours a week in 30 extended-care facilities owned by the same large for-profit firm. Licensed workers such as Registered Nurses (RNs) or Licensed Practical Nurses (LPNs) and unlicensed workers, such as Certified Nursing Assistants (CNAs), were surveyed in 2011–2012. A total of 1,083 of 1,524 eligible workers completed a computer-administered personal interview (CAPI) questionnaire. This study was approved by appropriate Institutional Review Boards.

Measures

Outcomes—Because schedule control was reported in 2011–2012, we assessed nursing home quality measures for 2012 that were retrieved from the Medicare Nursing Home Compare website. We examined three nursing home indicators that systematic reviews showed were linked to staffing characteristics: (1) percentage of long-stay high-risk residents with pressure ulcers, (2) percentage of long-stay residents whose need for help with daily activities has increased, and (3) percentage of long-stay residents who lose too much weight. Pressure ulcers (stages 1–4) were determined at residents' admission and then quarterly by RN's, following criteria of the International Classification of Diseases (ICD-9). The rate for decline in activities of daily living (ADL) refers to the percentage of long-stay residents whose need for help with daily activities has increased (e.g. bathing, bowel control, dressing, eating and functional mobility, among others). The rate for weight loss reflects the percentage of long-stay residents who lost five percent or more of body weight in a 30-day period. Quality measures are risk-adjusted, accounting for the differences in the distribution of high-risk residents across facilities (Mukamel et al., 2008).

Schedule Control—We operationalized schedule control with four questions about workers ability to (1) choose when to take days off or vacation, (2) when to start/end each work day, (3) when to take a few hours off, and (4) to decide how many hours to work each day. These four questions were extracted from an eight-item questionnaire of schedule control (L. T. Thomas & Ganster, 1995). Items were coded with a Likert scale from 1 (very little) to 5 (very much). The measure of schedule control had a Cronbach's alpha of 0.7. As predictor of schedule control, though, we conducted a Principal Component Analysis (PCA) to reduce the information of those four items based on their covariance into a single standardized variable (Z-Score). Individual scores were aggregated by facility.

Covariates—Potential confounders included: (1) staff mix (rate of licensed to unlicensed staff), (2) licensed staffing ratios (licensed-to-unlicensed staff hours per resident per day), (3) job satisfaction, and (4) turnover intentions, (5) number of certified beds, (6) average work hours per week, (7) average tenure at facility, and (8) proportion of staff working regularly on the day shift. Covariate information was obtained from the [Medicare.gov](https://www.medicare.gov) or from the employee survey. Job satisfaction (Bowling & Hammond, 2008) and turnover intentions (Boroff & Lewin, 1997) were measured with Likert scales (1 to 5), with a Cronbach's alpha of 0.80 for both scales.

Analysis

Data analyses began with Pearson correlations between staffing-related variables and schedule control. Random intercept models and intra-class correlations were calculated to determine if reports of schedule control significantly vary between facilities. Linear regressions models with robust standard errors were used to estimate the average effect of schedule control on each quality indicator, controlling for covariates that were correlated with both schedule control and nursing home quality indicators.

Results

Univariate and bivariate statistics for staff-related variables and quality indicators are displayed in Table 1. Schedule control was statistically significant correlated with higher job satisfaction and lower turnover intentions, higher tenure and more work hours. The variance term for schedule control significantly varied across nursing homes ($\sigma^2=0.05$, $p<0.05$), and about 7 percent of the variance of schedule control was attributable to facility-level clustering. After adjusting for potential confounders, one standard deviation (SD) increment in schedule control was associated with half a SD decline in the prevalence of pressure ulcers ($\beta= -0.51$, 95% CI $-1.01, -0.00$, $p<0.05$). Schedule control was not associated with decline of ADL or weight loss.

Discussion

Nursing home quality of care has been mostly examined in terms of staff mix or staff ratios, however, less is known about the association of the time arrangements at work with resident outcomes. We examined the association of schedule control with the prevalence of residents' pressure ulcers, weight loss and decline in activities of daily living, three quality indicators that systematic reviews have linked with staffing characteristics (Bostick et al., 2006). Schedule control significantly varied across facilities, and nursing homes where workers reported higher schedule control were facilities with lower prevalence of pressure ulcers.

Our findings introduce how the organization of time at work might be associated with quality of care, and complement other studies that showed that other time-related factors such as higher licensed staffing ratios (i.e. higher licensed-to-unlicensed hours per resident day) are predictors of better resident care (Castle, 2008; Castle & Ferguson, 2010; Rantz et al., 2004). Although we had no information regarding more proximal factors in the pathway between schedule control and resident care, we consider that a plausible mechanism is that higher schedule control improves the planning, supervision and delivery of preventive or curative strategies to lower pressure ulcers, such as controlling resident's time in bed, improving skin care and mobility (D. R. Thomas, 2003). We postulate this mechanism based on evidence from other industries such as office workers concluding that higher schedule control improves performance by giving workers' more resources to plan, execute and cope with job demands. These time-related resources are also linked with workers' job satisfaction and commitment (Kossek, Barber, & Winters, 1999). Our results support this potential mechanism given the strong correlations between schedule control with higher job satisfaction and lower intentions to quit. It is likely, then, that these same principles that

explain better performance among office workers apply to direct-care workers. Providing work-time resources like schedule control might enhance the planning and delivery of strategies to prevent or cure pressure ulcers, and can also contribute to higher job satisfaction (Horn et al., 2005).

Though we found that schedule control and weight loss were uncorrelated, nursing home staff can prevent high-risk residents' weight loss through intensive, tailored interactions during meal hours (Simmons et al., 2008). Schedule control and decline in ADL were not associated either. Deterioration of ADL may be indicative of resident acuity, and staff might have less ability to impact on deterioration of ADLs, compared to pressure ulcers, which are partially preventable by turning patients and moving them regularly.

Limitations

Given the small effective sample size of 30 facilities, our findings provide preliminary evidence but further research is needed to identify and test the mechanisms that could explain why schedule control might reduce the prevalence of pressure ulcers. Additionally, our small sample size does not necessarily guarantee external validity, though our facilities were similar to many other nursing homes in New England in terms of both facility-level and employee characteristics (Squillace et al., 2009). Schedule control information was maximized aggregating individual responses by facilities, however, the ecological design of our study is limited to show how specific direct-care workers could improve health of its assigned residents. Considering the relative small intra-class correlation, future multi-level research ought to examine individual differences in the reports of schedule control within sites and its potential implications on quality of care. Finally, although schedule control was ascertained prior to the outcomes, more research is needed to establish temporal ordering for all facilities.

Practice Implications

Introducing flexible initiatives like self-scheduling (Bailyn, Collins, & Song, 2007), cross-training, and supervisors' support for work-family balance could be applied in order to meet resident-care standards, and to aid the recruitment and retention of direct-care workers. Additionally, flexible strategies could be salient at extended-care facilities considering that this is an industry that employs many working mothers, often from socioeconomically disadvantaged communities (Okechukwu, El Ayadi, Tamers, Sabbath, & Berkman, 2012).

Conclusions

Nursing homes where staff reported higher schedule control were also facilities with lower prevalence of pressure ulcers, independently of correlated factors like job satisfaction and turnover intentions. While pressure ulcers have multiple causes, this outcome can be prevented through staff actions, particularly in relation to time in bed, which could be enhanced if workers have more ability to control their work hours.

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Univariate and bivariate staffing characteristics and quality indicators at nursing homes in New England (n=30).

Table 1

	Mean	Std. Dev	1	2	3	4	5	6	7	8	9	10	11	12
1. Schedule Control [†]	2.67	0.28	1											
2. Staff mix [‡]	0.41	0.16	0.02	1										
3. Staff ratios [§]	1.08	0.41	0.04	-0.08	1									
4. Job Satisfaction [†]	4.12	0.30	0.74 ^{***}	0.11	-0.21	1								
5. Turnover intentions [†]	2.21	0.34	-0.51 ^{**}	-0.48 ^{***}	0.38 [*]	-0.60 ^{***}	1							
6. Tenure (years)	7.83	1.86	0.44 [*]	0.09	-0.17	0.36 [*]	-0.49 ^{**}	1						
7. Total work hours	37.1	1.77	0.47 [*]	0.14	0.03	0.41 [*]	-0.34	0.17	1					
8. Regular day shift (%)	57.83	10.54	0.04	-0.65 ^{***}	0.66 ^{***}	-0.05	0.46 [*]	0.00	0.00	1				
9. Number of beds	114.0	38.01	0.15	-0.06	0.09	0.09	-0.04	-0.16	-0.02	0.27	1			
10. Pressure ulcers	4.11	2.38	-0.47 ^{**}	0.25	-0.10	-0.39 [*]	0.08	-0.01	-0.14	-0.13	-0.11	1		
11. Decline in ADL	7.77	2.72	0.22	-0.09	-0.12	0.19	0.05	0.00	0.28	0.15	-0.14		1	
12. Residents' weight loss	20.12	5.79	0.05	0.10	0.25	0.17	-0.19	0.03	-0.22	-0.40	0.07	-0.14	0.08	1

[†] Scales measured with a five-point Likert positive scale.

[‡] Ratio of licensed-to-unlicensed staff. Scores below 1 indicate a smaller proportion of licensed to unlicensed workers. Higher values indicate more licensed per unlicensed workers.

[§] Ratio of licensed-to-unlicensed hours per resident day. Scores below 1 indicate a fewer licensed hours. Higher values indicate more licensed per unlicensed workers.

* $p < 0.05$;

** $p < 0.001$;

*** $p < 0.0001$